morrison

# DINOSAURS!

•DISCOVER THE GIANTS OF THE PREHISTORIC WORLD•

43

SOR

UK £1.50
Republic of Ireland IR£1.50
Australia $3.75 Malta 75c
New Zealand $4.75 inc. GST
South Africa R6.75 inc. VAT
R6.14 (excl. Tax - other countries)
Singapore $4.50; Malaysia $5.50

ORBIS
DE AGOSTINI
—GROUP—

AN ORBIS PLAY & LEARN COLLECTION

# DINOSAURS!

**• DISCOVER THE GIANTS OF THE PREHISTORIC WORLD •**

## IDENTIKIT

Introducing more creatures from the distant past

HADROSAURUS 1009
CARCHARODONTOSAURUS 1012
MAGYAROSAURUS 1013

## DINOSAUR WORLD

CONQUEROR OF THE SKIES 1014

## SPOTTER'S GUIDE

Take a look at dinosaurs' TONGUES 1022

## TIME DETECTIVE

Did dinosaurs get sick? Join the hunt for clues about dinosaur INJURY AND ILLNESS 1024

## HISTORY IN PICTURES

Egg-stealer *Oviraptor* comes to a sticky end 1028

## A to Z

The dinosaur alphabet trail, from *Sellosaurus* to *Shunosaurus* 1032

## ASK THE EXPERT

Dr David Norman of Cambridge University has the answers to your dinosaur queries BACK COVER

## PLUS

### GIANTS OF THE PAST

Forest fire threatens to wipe out a herd of *Hadrosaurus* 1018

### 3-D Gallery

Put on your glasses and see *Diplodocus* defend their young from hungry *Allosaurus* 1020

### DINO Fact File

Are you a dino expert? Test your knowledge and learn more facts with our quiz 1030

## HOW TO CONTINUE YOUR COLLECTION

**Most people collect their issues by placing a regular order with their newsagent. You can, however, also obtain your copies directly in the following ways:**

**UK and REPUBLIC OF IRELAND**

**Subscriptions:**
Phone 0424 755755 for information (Mon-Fri, 9am-5pm).

**Back issues:**
If you miss any issues of DINOSAURS!, these can be ordered through your newsagent. Alternatively, you can order back issues by phoning 0424 755755 (Mon-Fri, 9am-5pm). Credit card orders accepted. Or write to:
Back Issues Department, DINOSAURS!,
PO Box 1, Hastings, TN35 4TJ.
Back issue charges: Issue 1: 30p. All other issues: £1.50. Postage and packing: 50p per copy. When ordering, please enclose:
1. Your name, address and postcode.
2. The issue number(s) and number of copies of each issue you require.
3. Your payment. This can be by postal order or cheque made payable to Orbis Publishing Ltd. You can calculate the amount based on the charges shown above.

**Binders:**
**UK**
DINOSAURS! binders are now available. Each binder holds 13 issues and costs just £4.95 (including £1 p&p).
You can order binders direct from:
DINOSAURS!, PO Box 1, Hastings, TN35 4TJ.
Please enclose payment for £4.95 for each binder. You can pay by cheque or postal order made payable to Orbis Publishing Limited, or phone 0424 755755. Telephone credit card orders are accepted.
**Republic of Ireland**
Binders are available through your newsagent, priced at £4.95.

**AUSTRALIA**
**Back issues:** Write to:
Gordon & Gotch Ltd, P.O. Box 290, Burwood, Victoria 3125. Please enclose your payment of the cover price plus $1 per issue p&h.
**Binders:** Details will be published in future issues. Or you can write to: DINOSAURS! Binders, Bissett Magazine Service Pty Ltd, MC Box 460, Eastern Mail Centre, Victoria 33110.

**NEW ZEALAND**
**Back issues:** Write for details to: Gordon & Gotch Ltd, P.O. Box 584, Auckland.
**Binders:** Details will be published in future issues. Or you can write for details to the address above.

**MALTA**
**Back issues:** These can be ordered through your newsagent.
**Binders:** Write for details to:
Miller (Malta) Ltd, Valetta.

**SOUTH AFRICA**
**Back issues:** Telephone 011 402 3816 for details. Or write to: Back Issues Department, Republican News Agency, PO Box 16034, Doornfontein, 2028. Please enclose your payment of the cover price plus 2 Rand per issue p&h.
**Binders:** These can be obtained at the shop where you bought this magazine.

**SINGAPORE, MALAYSIA**
**Back issues and binders:**
These can be obtained at the shop where you bought this magazine.

**DINOSAURS! is published by**
**Orbis Publishing Ltd**
**Griffin House**
**161 Hammersmith Rd**
**London W6 8SD**

**© 1994 Orbis Publishing**

**N43 94 01 27**

**Printed in Italy by Officine Grafiche**
**De Agostini, Novara**

# HADROSAURUS

**Plant-eating *Hadrosaurus* was the first known duckbilled dinosaur.**

William Parker Foulke was an amateur American fossil-hunter of the 19th century. He decided to re-excavate a clay pit in New Jersey, USA, where the bones of some large reptiles had been discovered in the 1830s.

### DIGGING DEEP

In 1858 Foulke found the pit, but it was filled in and overgrown. He continued his quest and dug down to a depth of 3m. There he discovered a large pile of fossil bones including teeth, arm and leg bones and 28 vertebrae.

### NEW THEORY

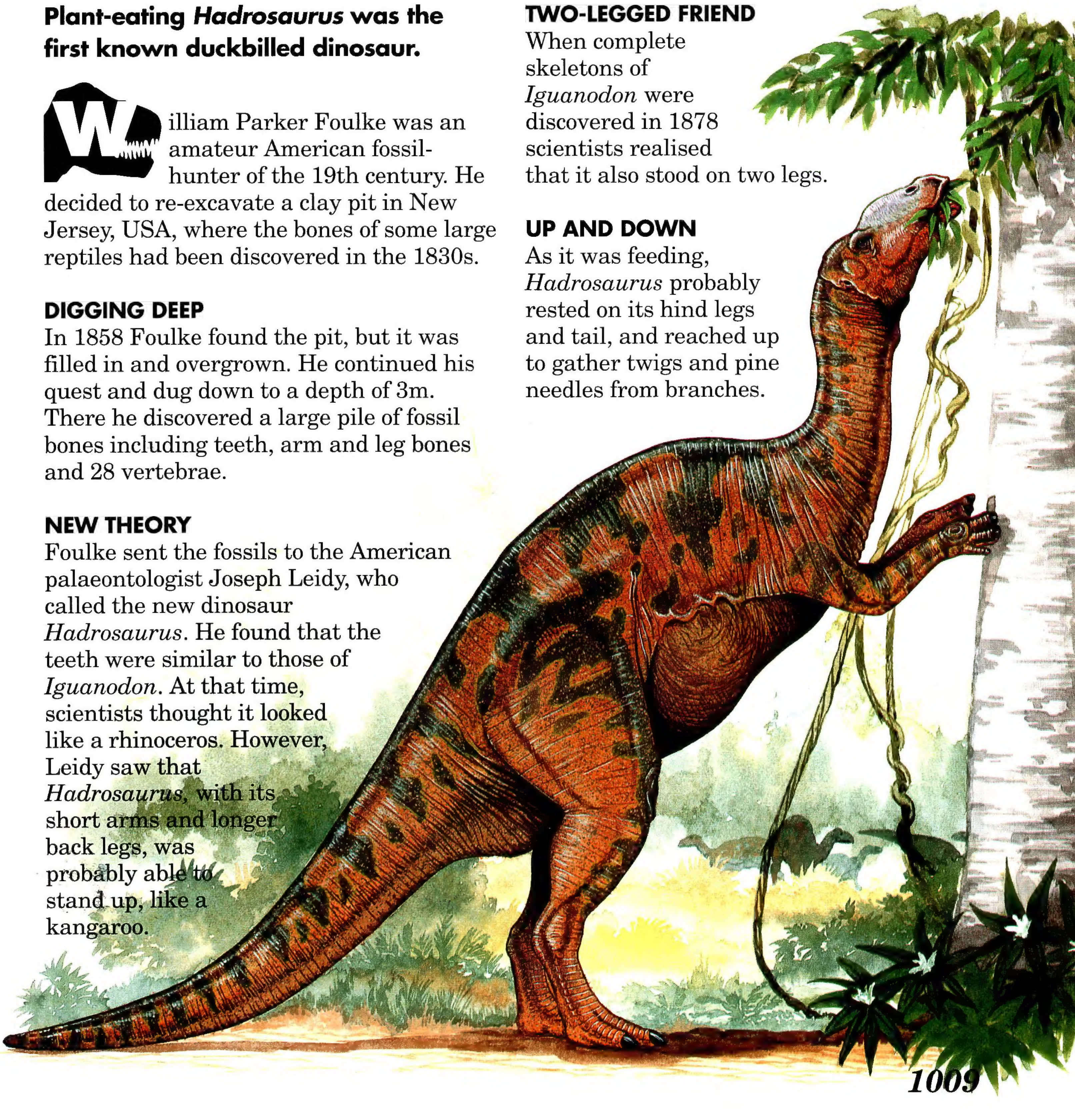
Foulke sent the fossils to the American palaeontologist Joseph Leidy, who called the new dinosaur *Hadrosaurus*. He found that the teeth were similar to those of *Iguanodon*. At that time, scientists thought it looked like a rhinoceros. However, Leidy saw that *Hadrosaurus*, with its short arms and longer back legs, was probably able to stand up, like a kangaroo.

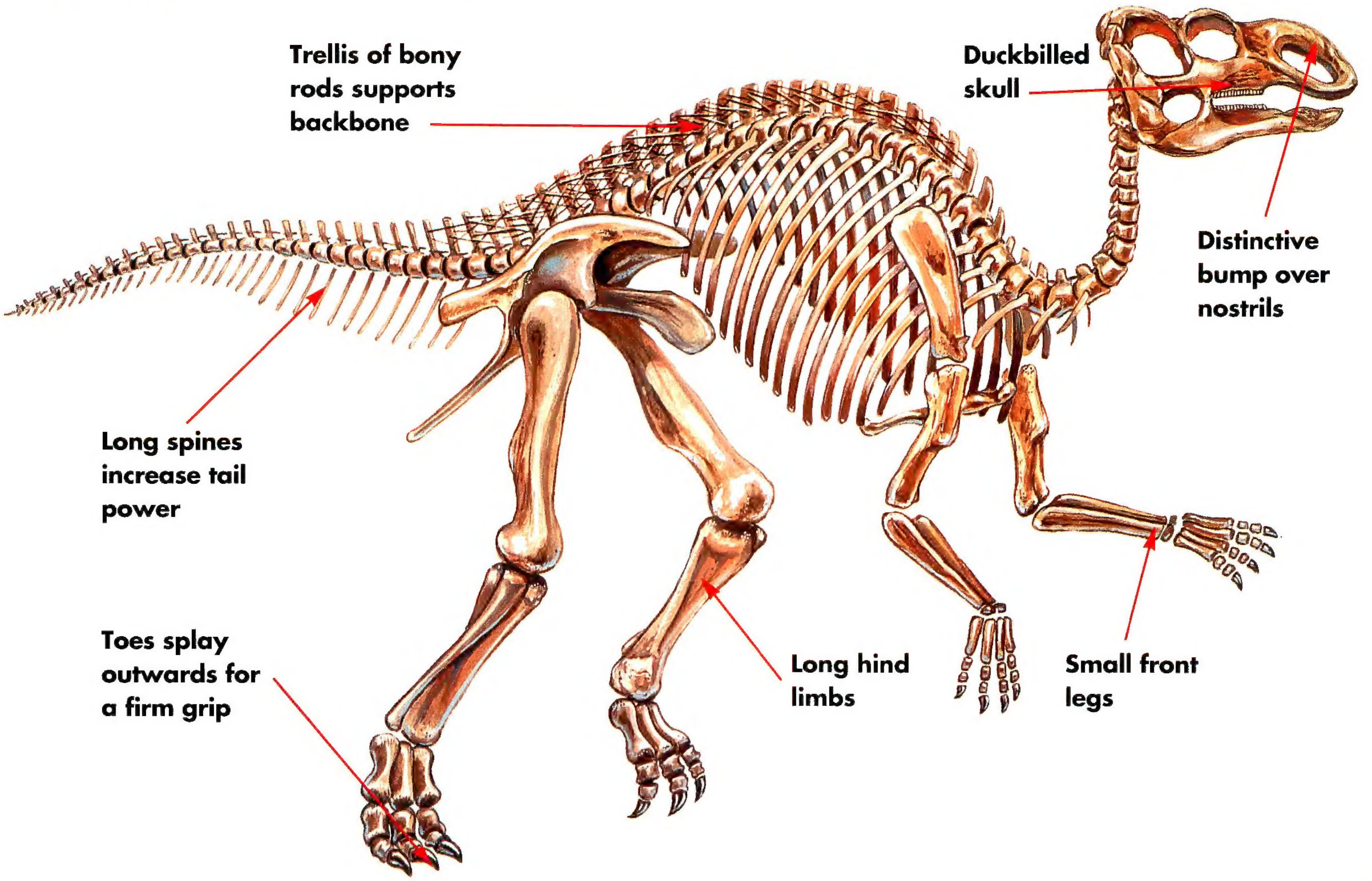
### TWO-LEGGED FRIEND

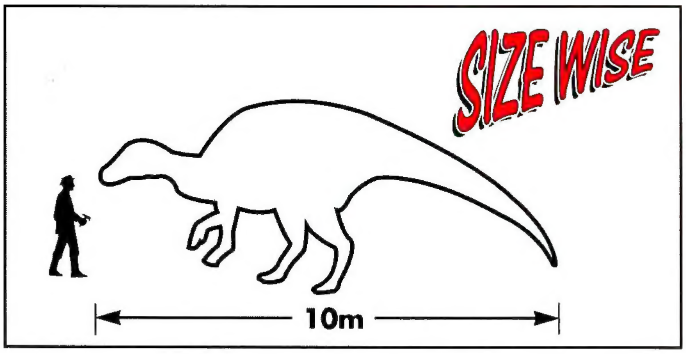
When complete skeletons of *Iguanodon* were discovered in 1878 scientists realised that it also stood on two legs.

### UP AND DOWN

As it was feeding, *Hadrosaurus* probably rested on its hind legs and tail, and reached up to gather twigs and pine needles from branches.




Trellis of bony rods supports backbone
Duckbilled skull
Distinctive bump over nostrils
Long spines increase tail power
Toes splay outwards for a firm grip
Long hind limbs
Small front legs

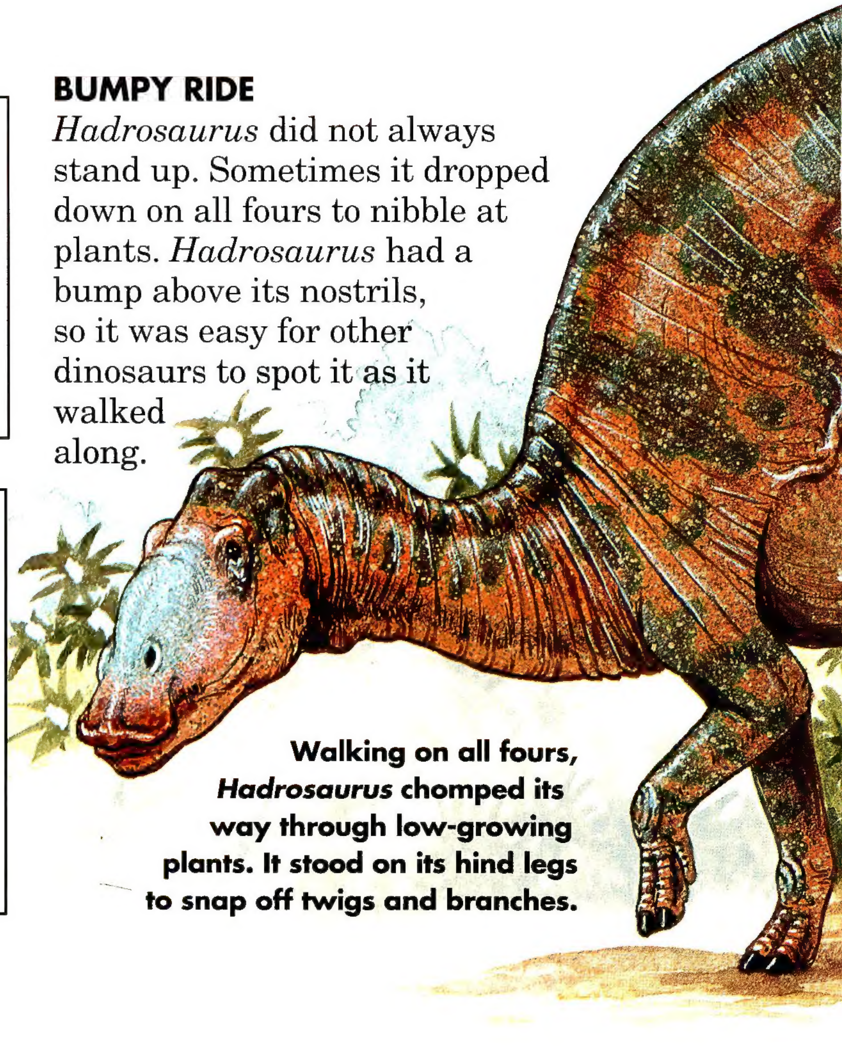


## MONSTER FACTS

- **NAME:** *Hadrosaurus* (had-roh-saw-rus) means 'big reptile'
- **SIZE:** 8 – 10m long
- **FOOD:** plants
- **LIVED:** about 80 million years ago in the Late Cretaceous Period in Alberta, Canada and New Jersey, USA

### BUMPY RIDE

*Hadrosaurus* did not always stand up. Sometimes it dropped down on all fours to nibble at plants. *Hadrosaurus* had a bump above its nostrils, so it was easy for other dinosaurs to spot it as it walked along.



**Walking on all fours, *Hadrosaurus* chomped its way through low-growing plants. It stood on its hind legs to snap off twigs and branches.**

### WOODY DIET

For many years, scientists thought that hadrosaurs lived like huge toads, wallowing in lakes and feeding on water weeds. But *Hadrosaurus* lived in an area where few water plants grew. It was surrounded by oak and willow trees. In 1922, the stomach contents of a hadrosaur were analysed and found to be full of seeds and twigs. *Hadrosaurus* seemed to prefer land plants to water weeds.

### MIGHTY MUNCH

Behind its wide, toothless beak *Hadrosaurus* had rows of teeth cemented together to form a flat, grinding surface. As it moved its powerful, muscular jaws up and down, the rough ridges of its teeth sliced and crushed the toughest food.

### SPLAYED TOES

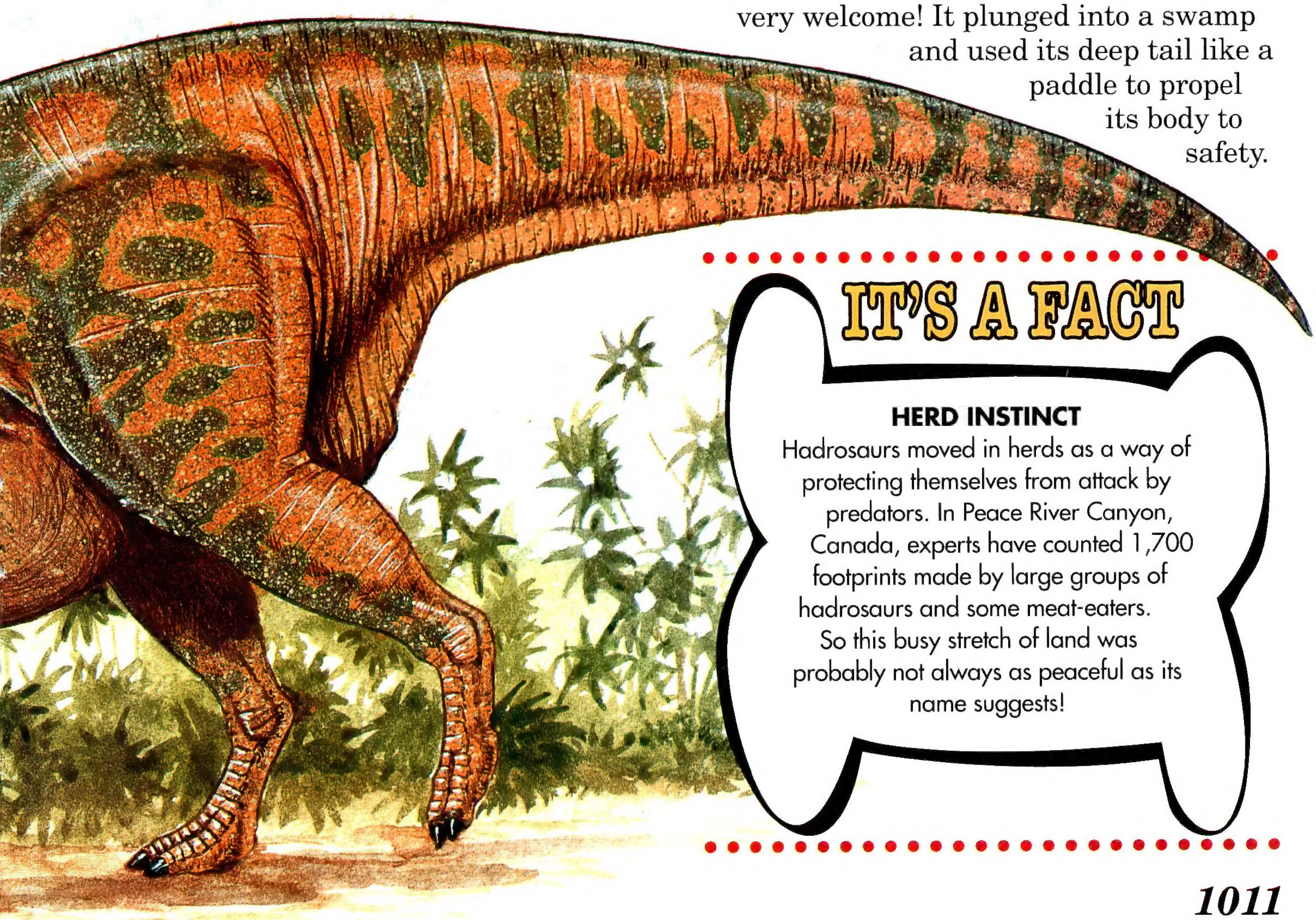
*Hadrosaurus* grew to be longer than a bus and its heavy body needed strong support. When it walked upright, it balanced on thick, pillar-like limbs and strong ankles. The three toes on each of its feet splayed outwards to provide a broad surface and a firm grip on the ground beneath.

### TRELLIS WORK

All along its back, *Hadrosaurus* had a trellis of bony rods. The criss-cross arrangement supported the dinosaur's backbone. Beneath its tail, long spines hung down to make a wide surface area.

### PADDLE POWER

*Hadrosaurus* liked to be on land but the appearance of a predator made water look very welcome! It plunged into a swamp and used its deep tail like a paddle to propel its body to safety.



## IT'S A FACT

### HERD INSTINCT

Hadrosaurs moved in herds as a way of protecting themselves from attack by predators. In Peace River Canyon, Canada, experts have counted 1,700 footprints made by large groups of hadrosaurs and some meat-eaters. So this busy stretch of land was probably not always as peaceful as its name suggests!

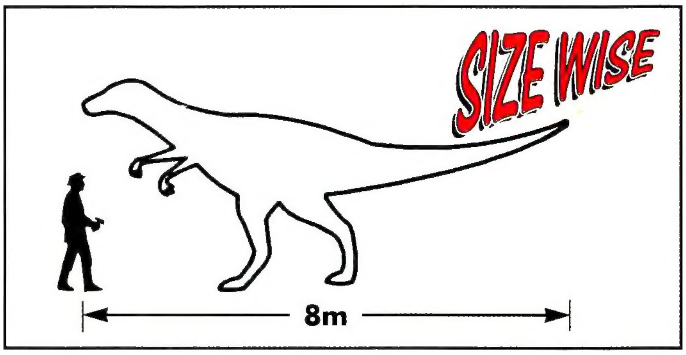
# CARCHARODONTOSAURUS

**With its huge, shark-like fangs *Carcharodontosaurus* was the 'Jaws' of the dinosaur world.**

*Carcharodontosaurus* was a fierce predator. Parts of its skull and lots of its teeth were found in the deserts of North Africa in the 1920s and early 1930s. The teeth varied in size. Some were as small as your little finger, but the biggest were as long as your whole hand.

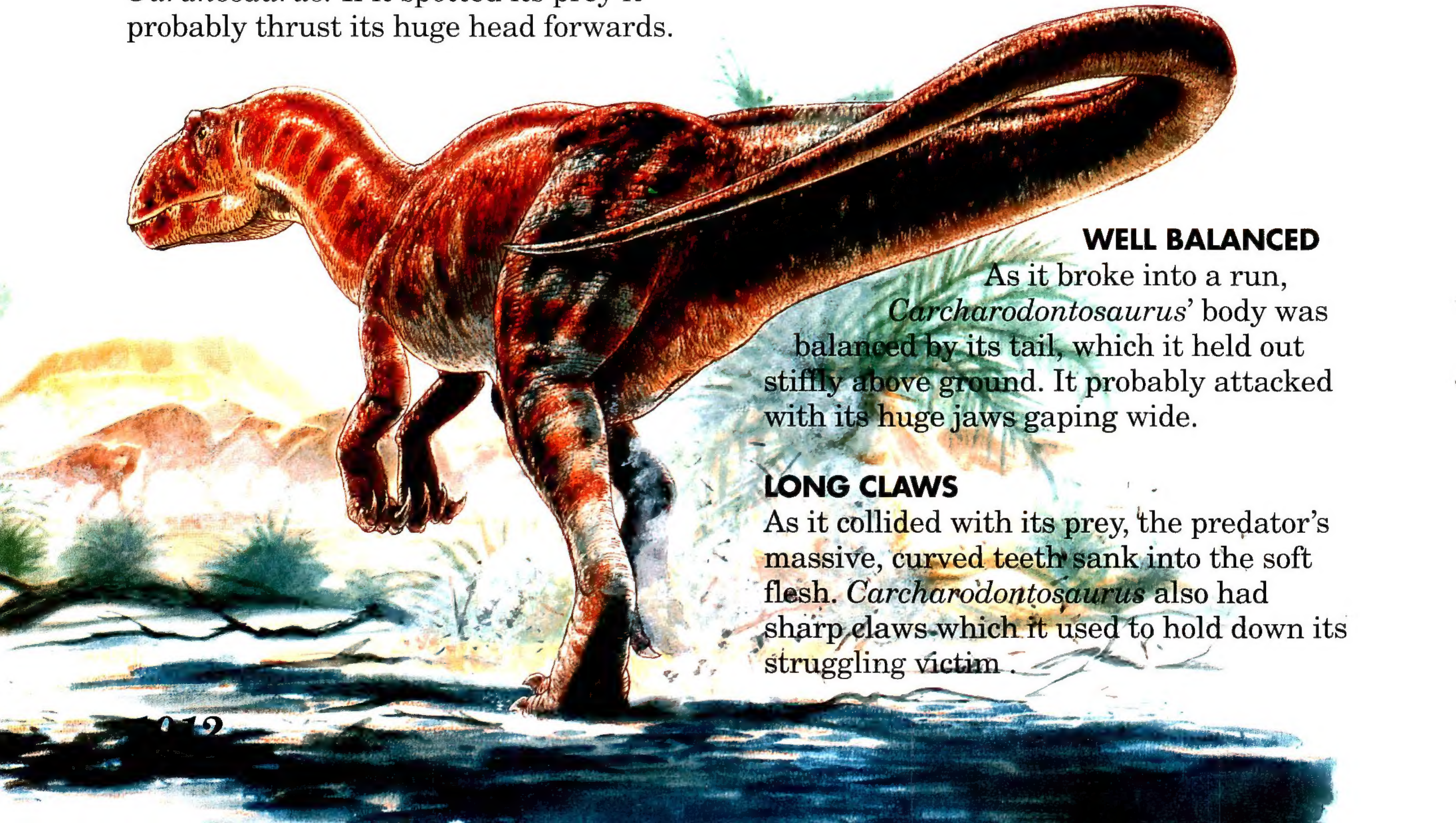
### HEAD FIRST

*Carcharodontosaurus* was as long as the distance between the posts of a football goal. It walked on two powerful legs and its short arms were positioned high on its body. It prowled around searching for likely prey such as plant-eating *Ouranosaurus*. If it spotted its prey it probably thrust its huge head forwards.



## MONSTER FACTS

- **NAME:** *Carcharodontosaurus* (kar-kar-oh-dont-oh-saw-rus) means 'Carcharodon reptile'
- **SIZE:** 8m long
- **FOOD:** meat
- **LIVED:** about 100 million years ago in the Cretaceous Period in North Africa



### WELL BALANCED

As it broke into a run, *Carcharodontosaurus*' body was balanced by its tail, which it held out stiffly above ground. It probably attacked with its huge jaws gaping wide.

### LONG CLAWS

As it collided with its prey, the predator's massive, curved teeth sank into the soft flesh. *Carcharodontosaurus* also had sharp claws which it used to hold down its struggling victim.

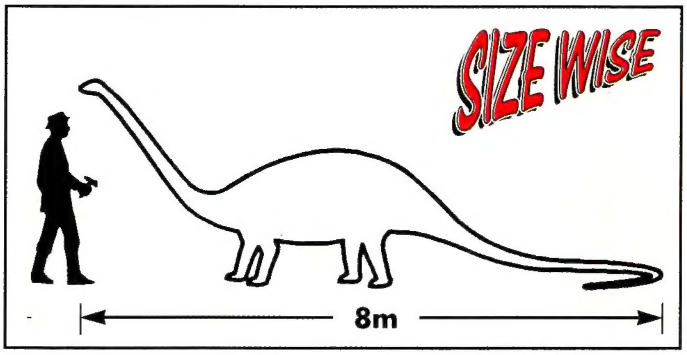
# MAGYAROSAURUS

***Magyarosaurus* was as long as two rhinoceroses and looked like a miniature *Diplodocus*.**

*Magyarosaurus* probably lived at the end of the Cretaceous Period. Most of the large sauropods, such as *Diplodocus*, lived about 80 million years before, during the Jurassic. *Magyarosaurus* was only about a quarter of the size of these huge dinosaurs.

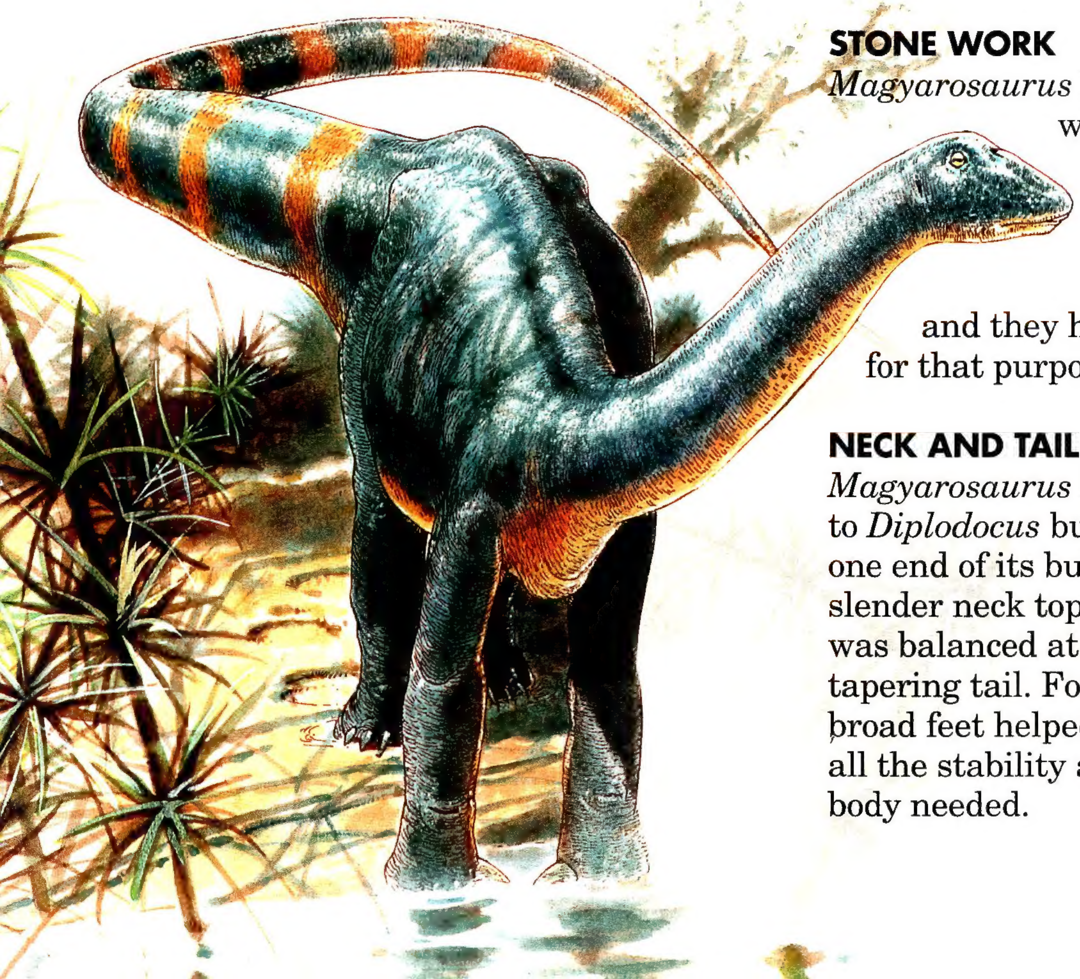
## LEAFY LUNCH

Plant-eating *Magyarosaurus* probably raked off leaves from branches and swallowed them whole, without chewing. All the food was then broken down inside the dinosaur's stomach.



## MONSTER FACTS

- **NAME:** *Magyarosaurus* (mag-yar-oh-saw-rus) means 'Magyar reptile'
- **SIZE:** 6 – 8m long
- **FOOD:** plants
- **LIVED:** about 70 million years ago in the Late Cretaceous Period in Romania, Europe



## STONE WORK

*Magyarosaurus* had a large stomach where tough plants and vegetation were pounded and crushed to a pulp by stones. These stones were called gastroliths and they had been swallowed exactly for that purpose.

## NECK AND TAIL

*Magyarosaurus* had similar proportions to *Diplodocus* but on a smaller scale. At one end of its bulky body it had a long, slender neck topped by a small head. This was balanced at the other end by a long, tapering tail. Four pillar-like legs and broad feet helped to give *Magyarosaurus* all the stability and strength its stocky body needed.

# Conqueror of the skies

**About 65 million years ago a huge creature took to the skies and soared above the plains of North America. Its name was *Quetzalcoatlus*.**

*Quetzalcoatlus* was one of the last of the winged pterosaurs, or flying reptiles. And it was the biggest animal ever to fly over the Earth.

### MANY QUESTIONS

The first preserved bones of the great *Quetzalcoatlus* were discovered in 1971. They caused huge excitement. How could such a vast animal fly? What was its lifestyle? And why did it die?

### BIG BEND PARK

Douglas Lawson found the first huge bone in the Cretaceous rocks at Big Bend Park in Texas, USA. When it rains at Big Bend, the soft rock crumbles and washes down into the Rio Grande River, leaving fossils sticking out.

### BITS OF BONE

Lawson noticed bits of bone sliding down a cliff face. He followed them upward and found a fossil bone 1m long sticking out from the rock. He dug part of it out and took it back to his professor.

### HOLLOW BONES

Wann Langston, Lawson's professor at the University of Texas, realised that the bone was from a flying reptile – a pterosaur. It was hollow and thin-walled, which made it very light. But he could not believe its size.

### VAST WINGS

Scaled up from this wing bone, Langston reckoned the creature's wings were almost 15m across! He and Lawson rushed back to the site, hoping to dig out the rest of this monster-flier. They found more parts of the wing, but little else.

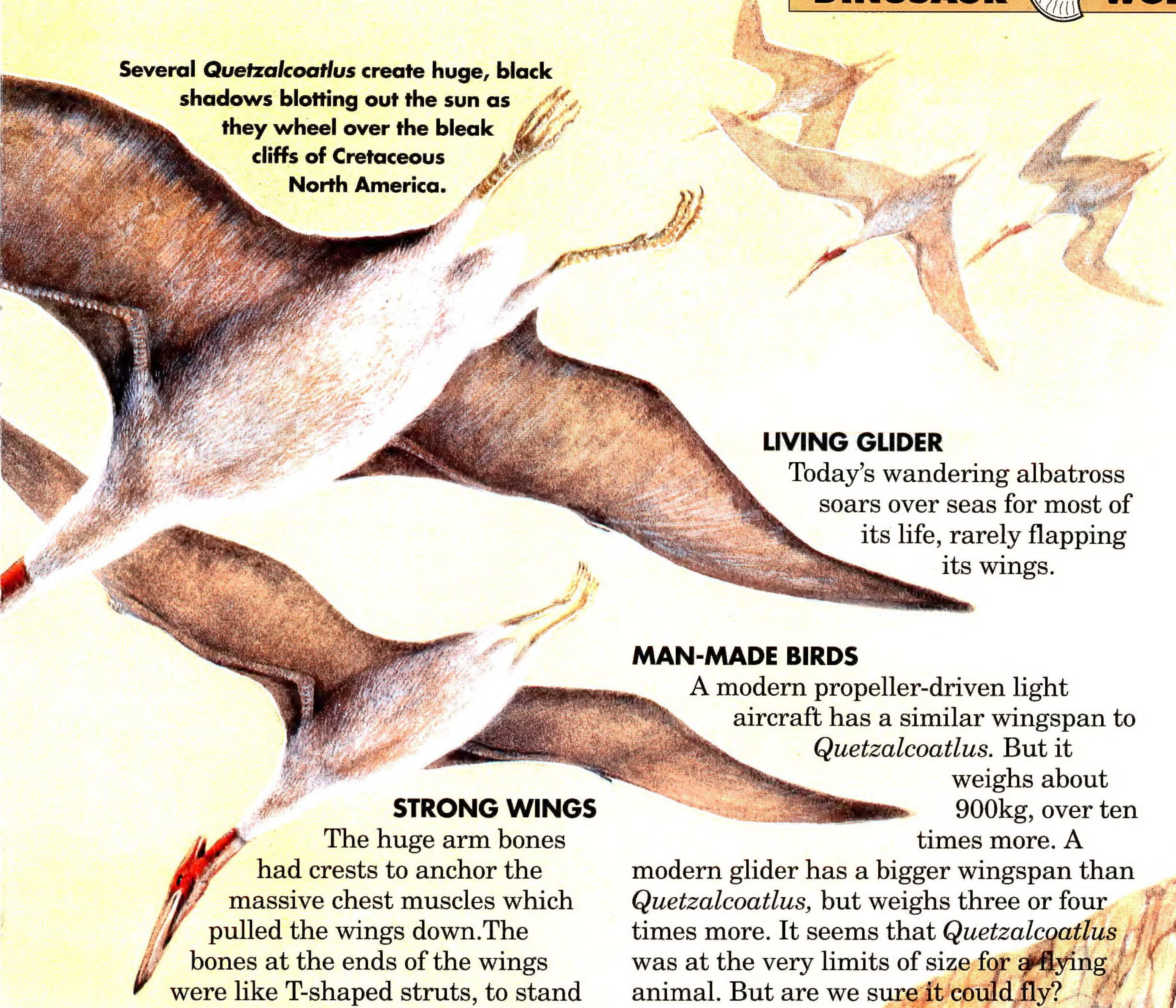
### UNSUCCESSFUL SEARCH

The huge animal was named *Quetzalcoatlus*. Langston searched the site for years and found many similar fossils. But they were smaller – from youngsters, or perhaps a smaller species.

### BIG AND HEAVY

*Quetzalcoatlus'* wingspan turned out to be slightly smaller than first thought – about 11m. The reptile probably weighed around 80kg, almost the same as a large adult human.

**Big Bend Park in Texas (left) where *Quetzalcoatlus'* bones were first found.**



**Several *Quetzalcoatlus* create huge, black shadows blotting out the sun as they wheel over the bleak cliffs of Cretaceous North America.**

## STRONG WINGS

The huge arm bones had crests to anchor the massive chest muscles which pulled the wings down. The bones at the ends of the wings were like T-shaped struts, to stand the huge strain as the great wings flapped.

## HOW HUGE?

*Quetzalcoatlus* was far bigger than the bird with the biggest wingspan today – the wandering albatross. Its wingspan is 3.5m, and it weighs less than 10kg.

**Today's biggest bird is the albatross (above).**

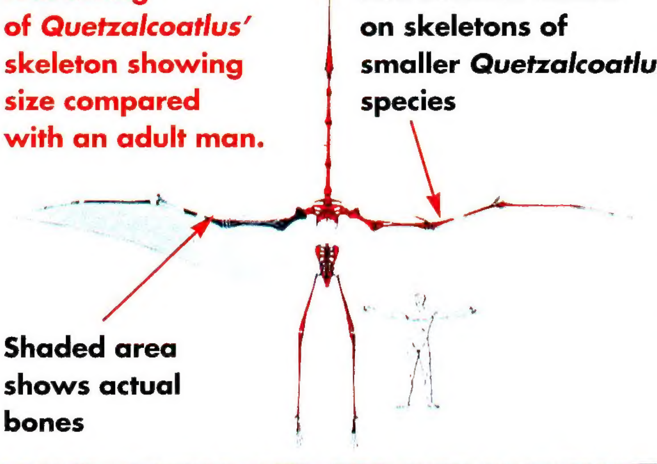
## LIVING GLIDER

Today's wandering albatross soars over seas for most of its life, rarely flapping its wings.

## MAN-MADE BIRDS

A modern propeller-driven light aircraft has a similar wingspan to *Quetzalcoatlus.* But it weighs about 900kg, over ten times more. A modern glider has a bigger wingspan than *Quetzalcoatlus,* but weighs three or four times more. It seems that *Quetzalcoatlus* was at the very limits of size for a flying animal. But are we sure it could fly?

**A drawing of *Quetzalcoatlus'* skeleton showing size compared with an adult man.**



**Red sections based on skeletons of smaller *Quetzalcoatlus* species**

**Shaded area shows actual bones**

### FEEDING THE GIANT

Many pterosaurs probably fed on fish. But *Quetzalcoatlus* did not live near the sea or large lakes. And it did not have the pointed, fish-gripping teeth of its relatives. Instead, it had a long, narrow, toothless beak with a ridge along the top. The bones of its neck were very long and fixed firmly together, which meant its neck didn't bend easily. So how did *Quetzalcoatlus* feed?

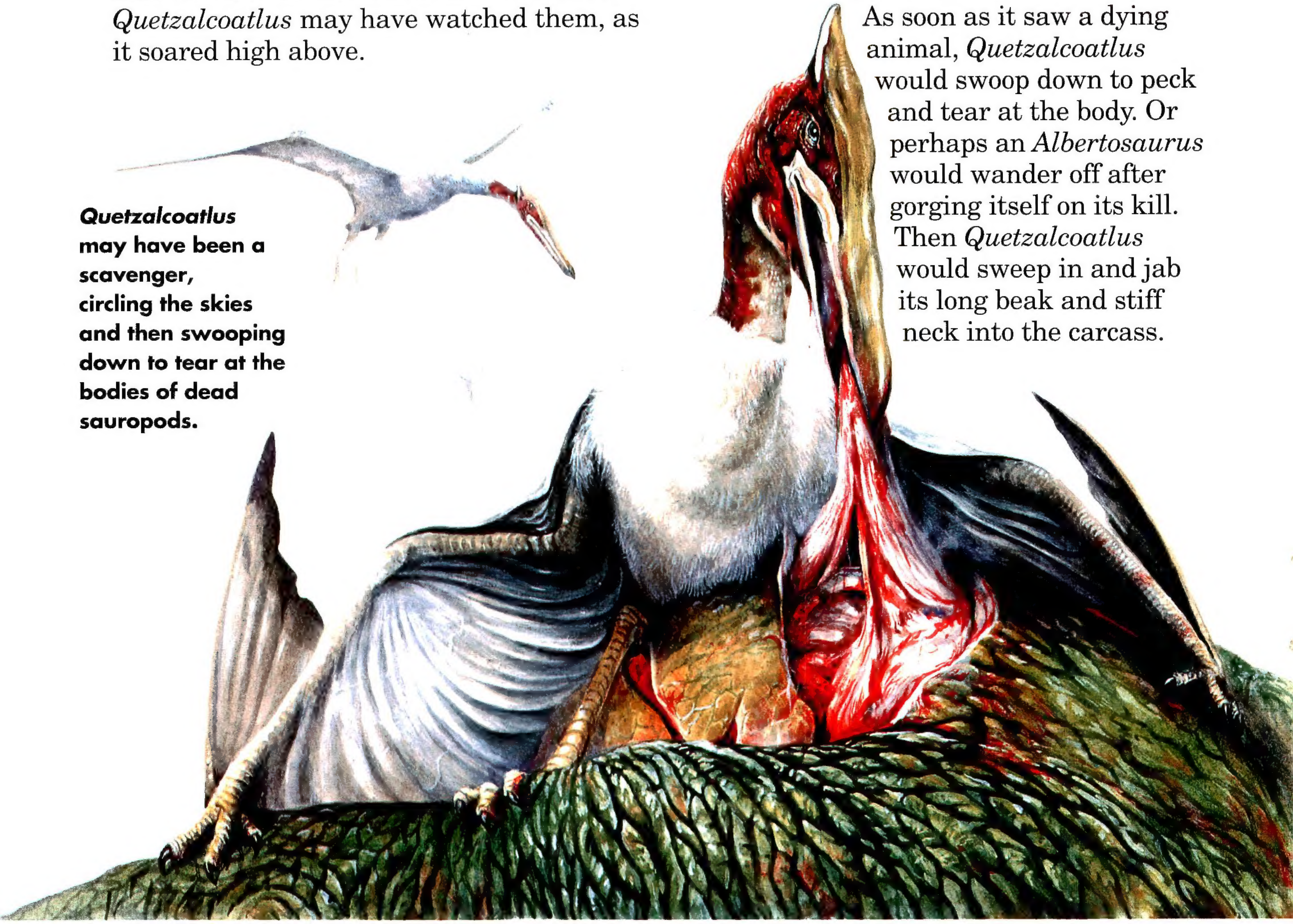
### PREHISTORIC VULTURE?

One idea was that *Quetzalcoatlus* was a scavenger, like condors and other vultures today. Many large dinosaurs lived in the same area of Cretaceous North America. *Quetzalcoatlus* may have watched them, as it soared high above.

**Modern vultures (below) use their flexible necks to peck off every morsel of flesh from a carcass.**

### IN AT THE KILL

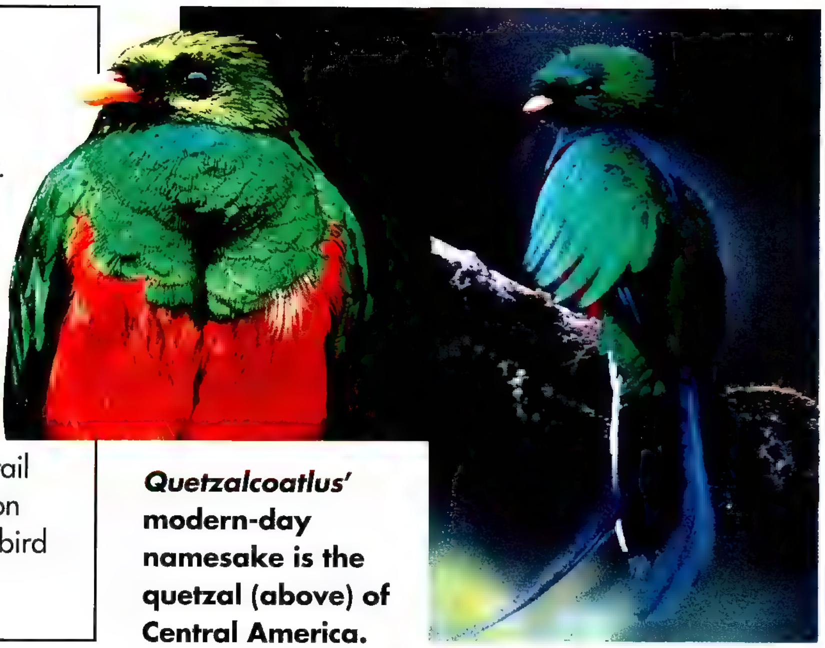
As soon as it saw a dying animal, *Quetzalcoatlus* would swoop down to peck and tear at the body. Or perhaps an *Albertosaurus* would wander off after gorging itself on its kill. Then *Quetzalcoatlus* would sweep in and jab its long beak and stiff neck into the carcass.



***Quetzalcoatlus* may have been a scavenger, circling the skies and then swooping down to tear at the bodies of dead sauropods.**

## Is it true that *Quetzalcoatlus* still lives?

*Quetzalcoatlus* is still around today. But it's not a pterosaur. It's a bird called a quetzal. It lives in the warm, damp mountain forests of Central America. The male has a brilliant green body, a scarlet chest, a golden and electric-blue back, and magnificent green feathers 75cm long, trailing like a tail. The quetzal was a sacred bird to the Aztecs. They carefully removed its tail feathers to use in ceremonies. The feathers soon grew again. Today the quetzal is the national bird of Guatemala, in South America.



***Quetzalcoatlus'* modern-day namesake is the quetzal (above) of Central America.**

### PERHAPS NOT!

After a feed, *Quetzalcoatlus* would have found it even harder to take off with a full stomach. It would then be at the mercy of *T rex* and other powerful hunter-scavengers. A modern vulture is better equipped for this type of life. It has a flexible neck to peck around bones. And with its sharp beak and claws it can defend itself against hyenas and even lions.

**In 1985, Dr Paul MacCready and his team built a half life-size replica of a *Quetzalcoatlus* (below). It could fly at speeds of up to 56km/h.**

### STUCK IN THE MUD

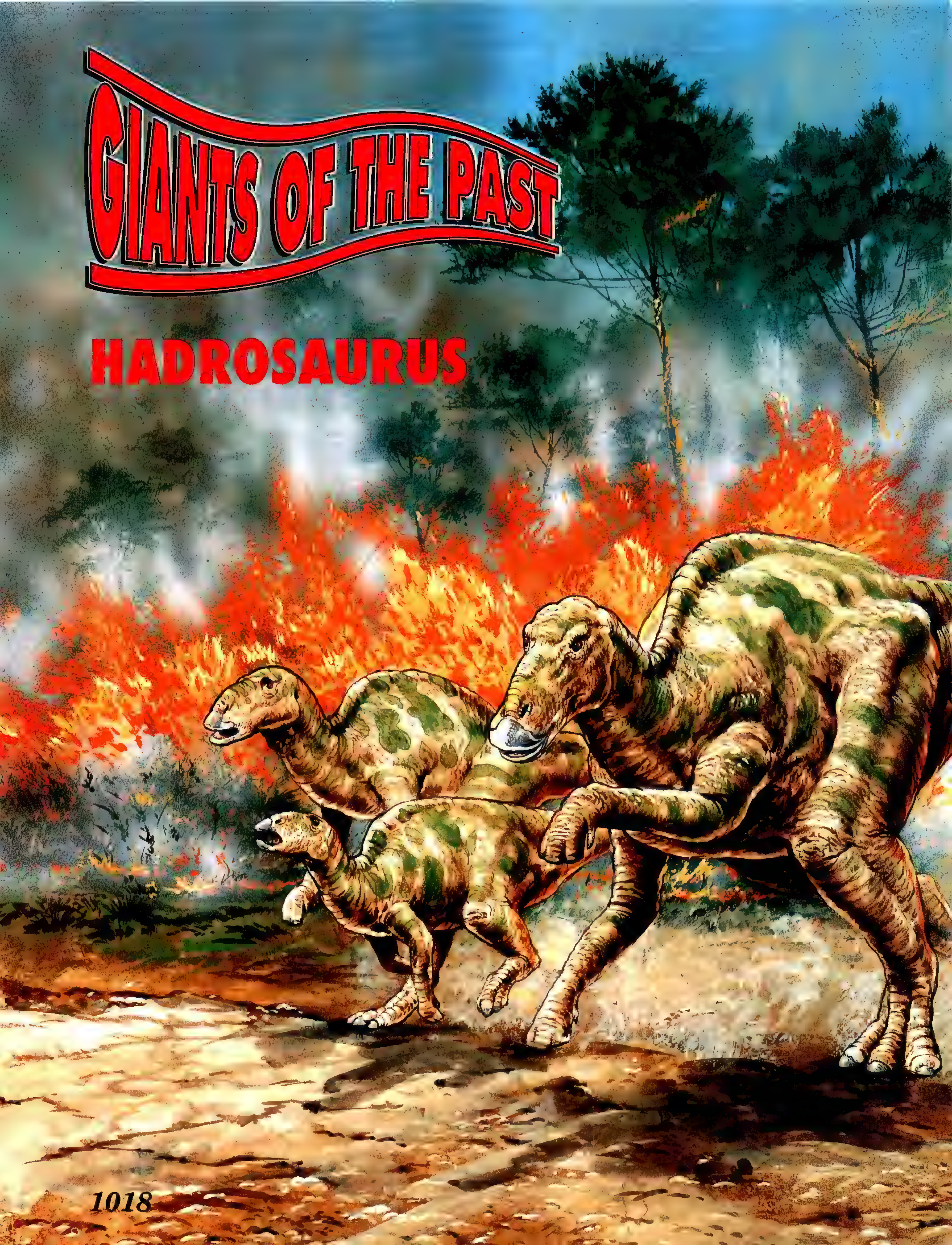
*Quetzalcoatlus* may have used its long, pointed beak for delving into the mud along the riverbank, for shellfish and freshwater crabs. But its great body might have stuck in the mud.

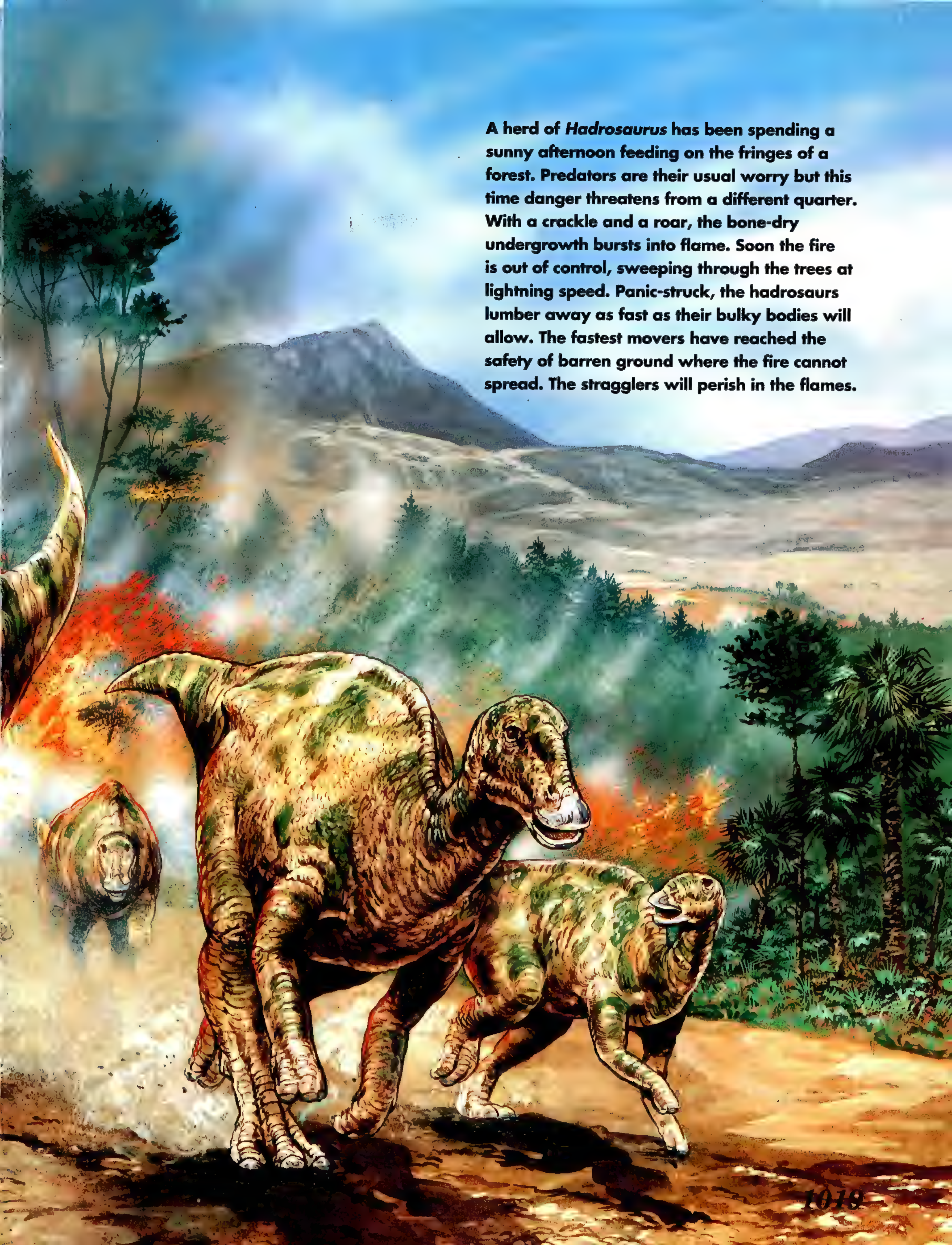
### FISHY STORY

Perhaps *Quetzalcoatlus* did live near the sea. It may have migrated from its inland breeding grounds to the coast with its young. There are still questions about this pterosaur to be answered. Finding more fossils will help us to answer them.

# GIANTS OF THE PAST

## HADROSAURUS

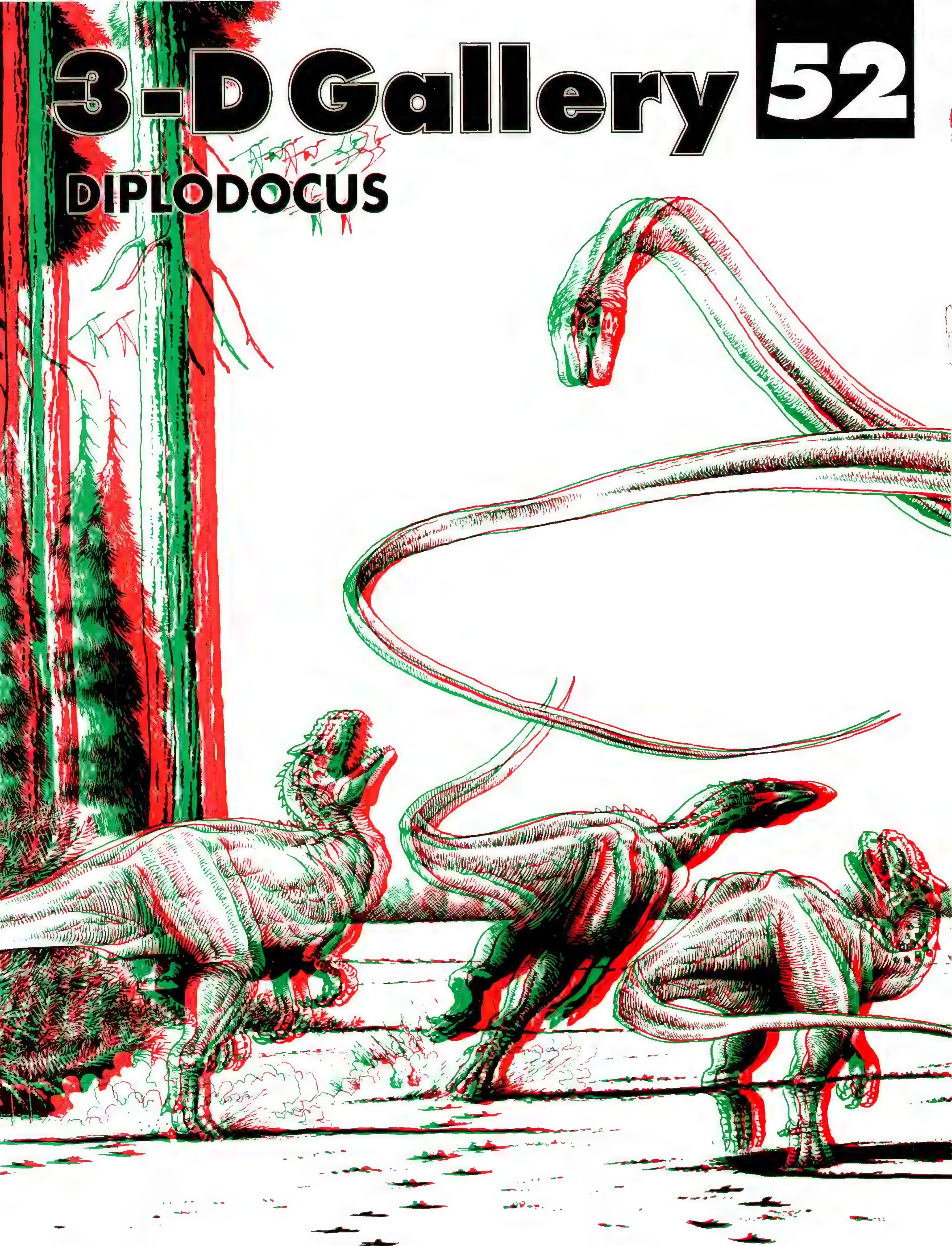


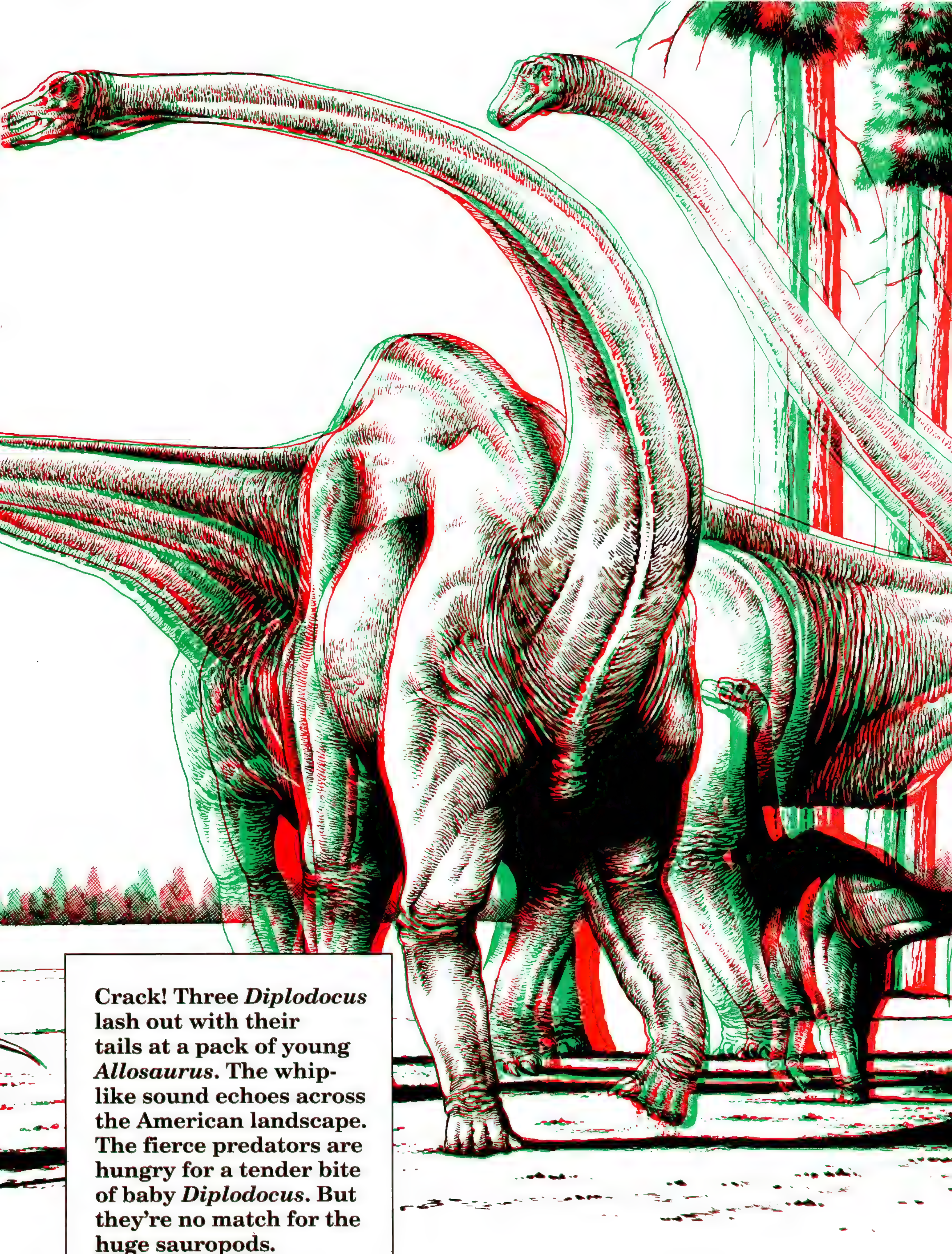


A herd of *Hadrosaurus* has been spending a sunny afternoon feeding on the fringes of a forest. Predators are their usual worry but this time danger threatens from a different quarter. With a crackle and a roar, the bone-dry undergrowth bursts into flame. Soon the fire is out of control, sweeping through the trees at lightning speed. Panic-struck, the hadrosaurs lumber away as fast as their bulky bodies will allow. The fastest movers have reached the safety of barren ground where the fire cannot spread. The stragglers will perish in the flames.

# 3-D Gallery 52

## DIPLODOCUS





Crack! Three *Diplodocus* lash out with their tails at a pack of young *Allosaurus*. The whip-like sound echoes across the American landscape. The fierce predators are hungry for a tender bite of baby *Diplodocus*. But they're no match for the huge sauropods.

# Tongues

**All dinosaurs had tongues. But what did they use their tongues for?**

*Struthiomimus* may have used its tongue – as modern reptiles do – to 'smell' the air.

There are no fossils of tongues because there are no bones in tongues. So how do we know dinosaurs had them? The tongue is attached to bones in the throat, and many fossils of these have been found inside dinosaur necks. But no-one knows for sure what dinosaurs' tongues were like.

### TONGUES FOR TASTING

Have you ever wondered why humans have tongues? We use them to taste and swallow food, and to help us speak. Our tongues have tiny sensory organs called taste buds. Taste buds tell us whether something is salty, sweet, sour or bitter.

### SAFE TO EAT?

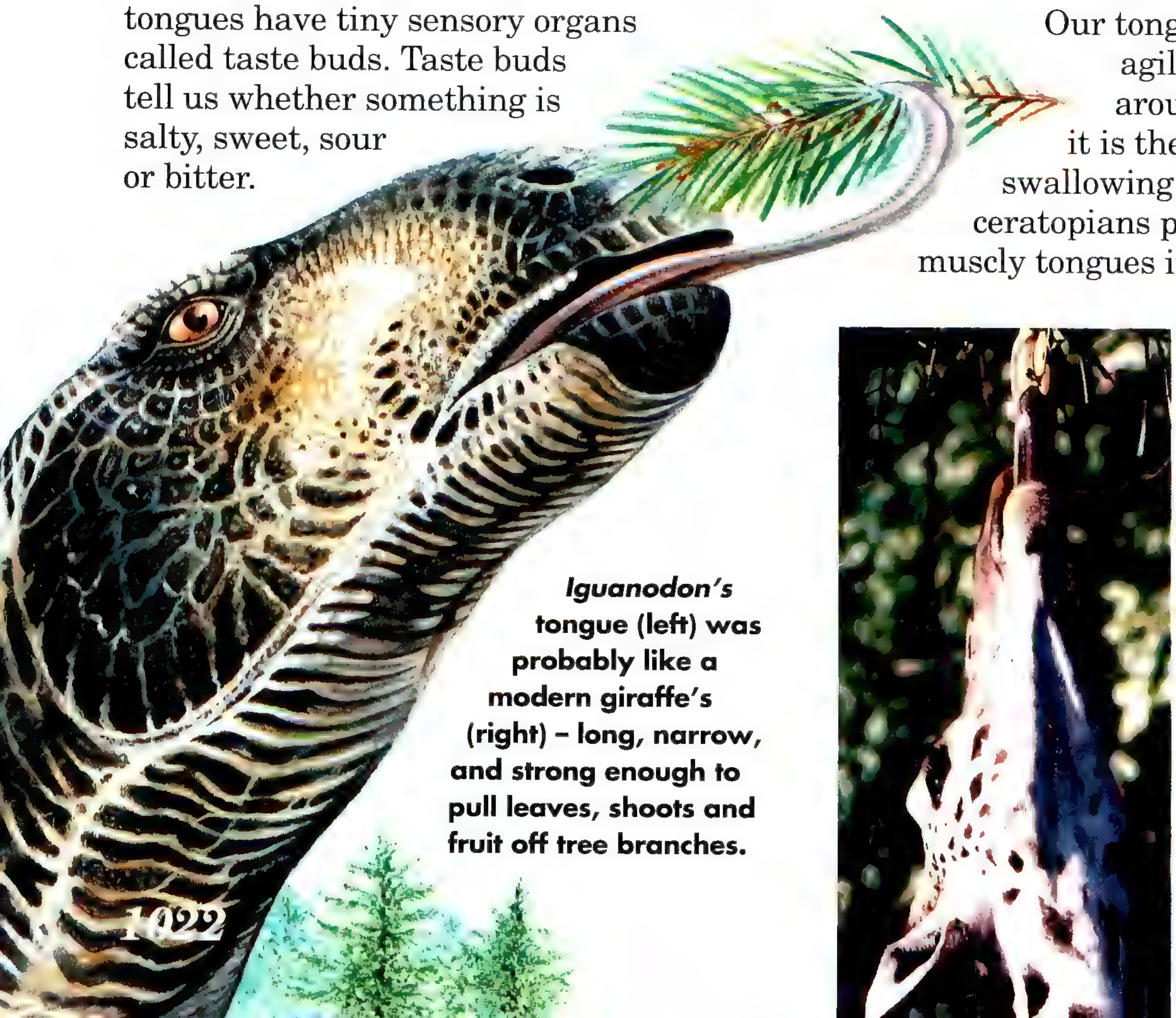
Taste is very useful to animals because it warns them when something is poisonous. If an animal or plant tastes strange the animal will leave it well alone! Dinosaurs may have had taste buds on their tongues to help them identify poisonous things.

### MUSCLY TONGUES

Our tongues are muscly and agile. They move food around our mouths until it is the perfect shape for swallowing. Hadrosaurs and ceratopians probably had narrow, muscly tongues in their long mouths.

### STRONG PULL

Some dinosaurs may have had amazingly strong tongues which they used to pull in their prey, or grab branches and leaves. This is known as a prehensile tongue. Today's giraffe has a tongue like this.



*Iguanodon's* tongue (left) was probably like a modern giraffe's (right) – long, narrow, and strong enough to pull leaves, shoots and fruit off tree branches.

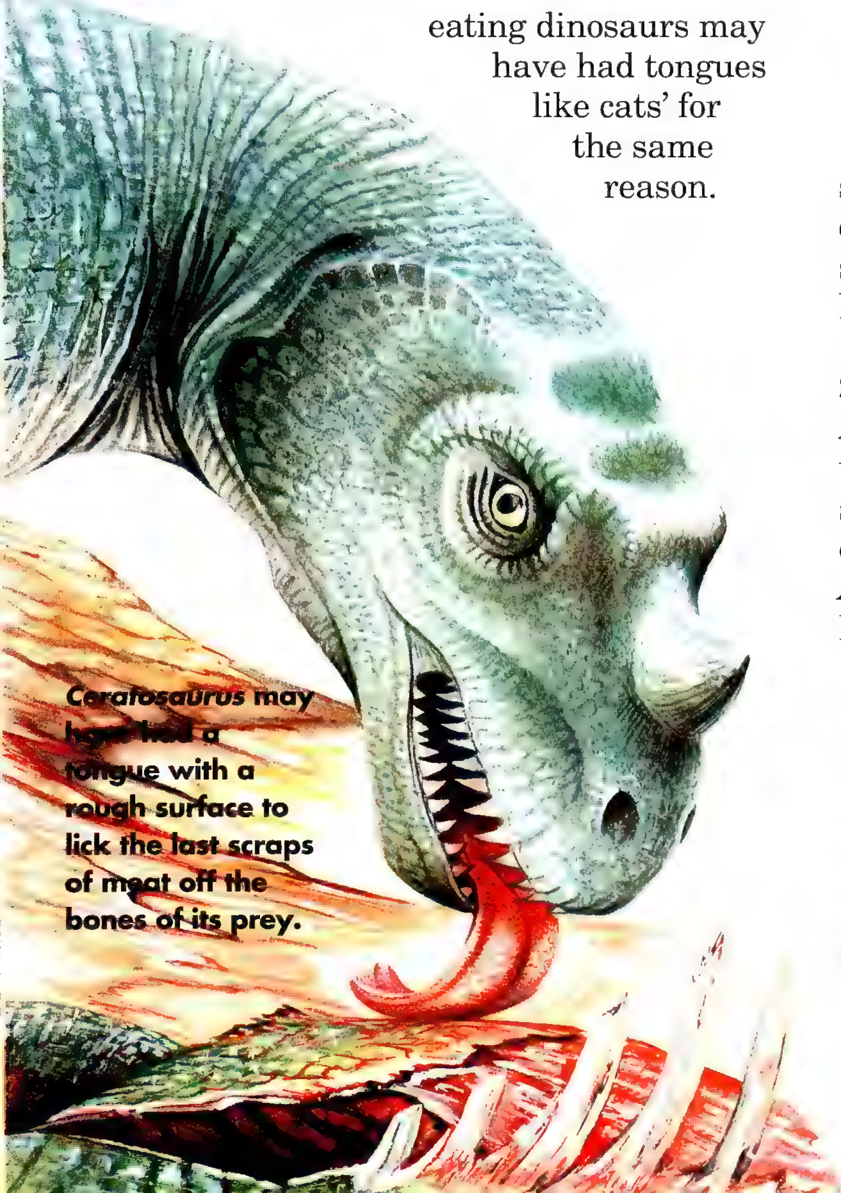
**The skink lizard can 'smell' the air with its tongue.**

### SMELLING TONGUES

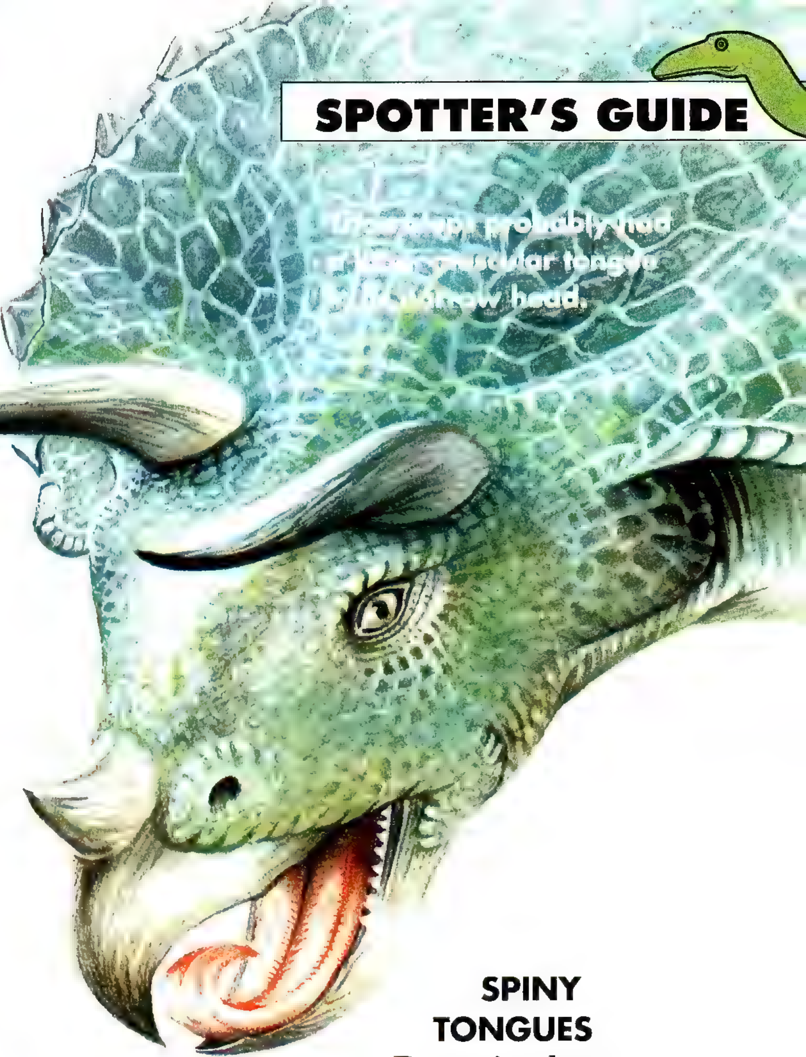
Like today's lizards, dinosaurs may have smelled the air with their tongues. Sensory organs picked up other animals' scent.

### ROUGH SURFACE

Cats have rough tongues. They use them like scouring pads to clean themselves. They also use them to scrape the last bits of flesh off bones. Meat-eating dinosaurs may have had tongues like cats' for the same reason.



***Ceratosaurus* may have had a tongue with a rough surface to lick the last scraps of meat off the bones of its prey.**



**Triceratops probably had a [illegible] muscular tongue in its narrow head.**

### SPINY TONGUES

Penguins have tongues with small spines all over them. They are useful for catching and holding on to slippery prey, such as fish. Perhaps fish-eating dinosaurs like *Baryonyx* had spiny tongues too.

### STICKY TONGUES

Ant-eaters have incredibly long tongues which they push inside termite nests. The sticky, saliva-coated surface traps masses of insects. Insect-eating dinosaurs like *Avimimus* and *Ornithomimus* may have had sticky tongues just like this.

**Cats today use their rough tongues for lapping milk, as well as for washing.**

# Injury and illness

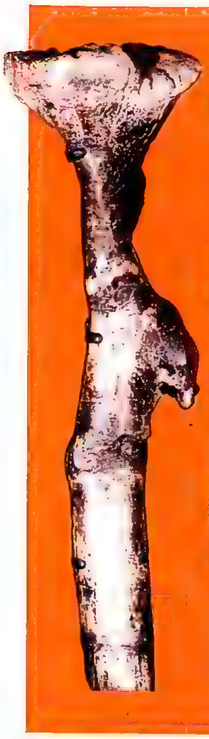
**Did dinosaurs get ill? What happened to a wounded dinosaur? Careful detective work provides the clues.**

Animals living in the wild need to stay strong and healthy to survive. There are no vets to help the sick and injured. Any creature that cannot defend itself properly is easy prey for a hungry predator. Many millions of years ago, dinosaurs were just as vulnerable.

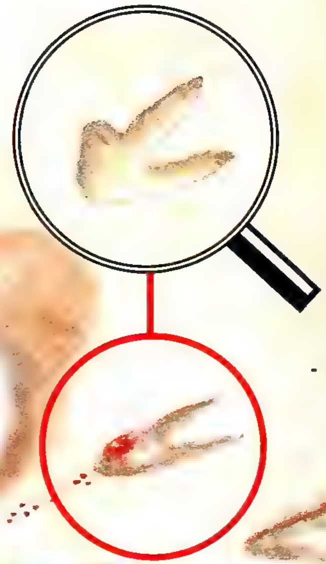
## A LIKELY END

Very few dinosaurs probably lived long enough to die of old age. They were more likely to be killed by predators, or to die as a result of being injured or catching a disease.

### BONING UP



**There were no bandages to help dino bones heal. The *Iguanodon* bone (left) has a bump where it mended itself.**



**Fossilized trackways can tell us about dinosaur illnesses. One toe from this *Ornitholestes* footprint is missing. So it was probably injured.**

**These two *Ornitholestes* (right) are locked in a fierce struggle. Who will win?**

## CUT AND THRUST

Dagger-like teeth, knife-sharp claws and spiky tail-clubs were just a few of the fearsome weapons dinosaurs possessed. They were built to fight and kill and the wounds they made were terrible.

## DEATHLY STRUGGLE

When they fought, dinosaurs locked horns or banged heads just as stags do today to win more territory or females. Experts have discovered the fossilized skeletons of two dinosaurs which died fighting. They belonged to a meat-eating *Velociraptor* and a plant-eating *Protoceratops* which were locked together in a duel to the death.

## WAR WOUNDS

Not all dinosaur battles were duels to the death. Some injured dinosaurs did survive in spite of their wounds. They would have had to hide themselves away until their injury had healed. It must have been difficult to find food when they were ill.

## HEALING POWER

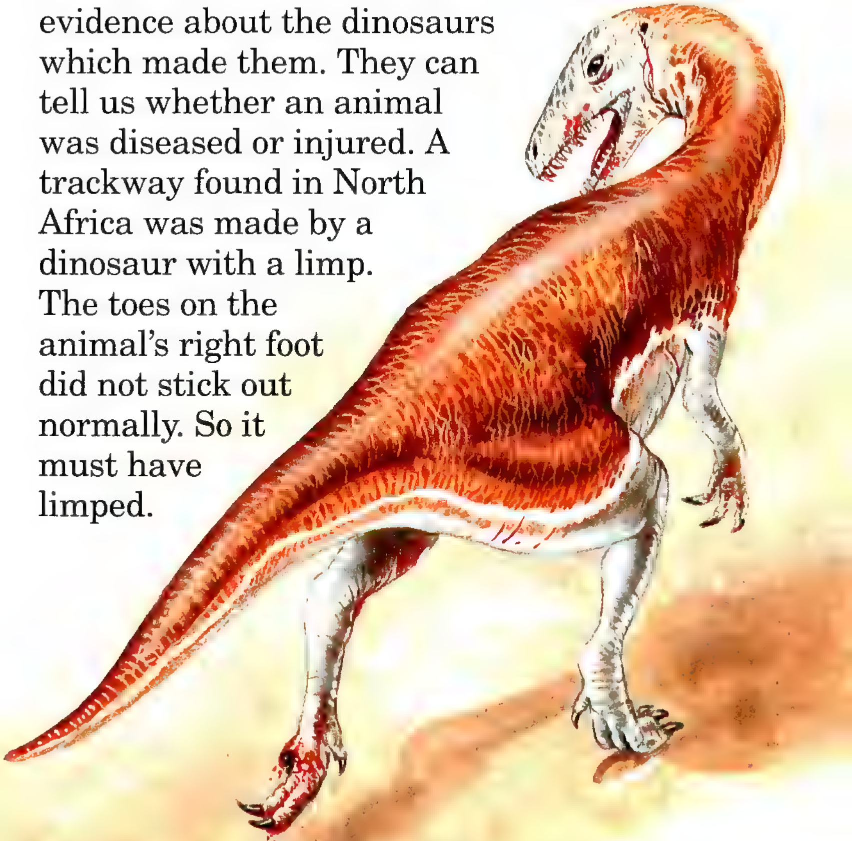
Broken dinosaur bones had to mend together by themselves. There were no splints or plaster casts to make sure they healed back evenly!

## TELL-TALE CLUES

Scientists can often tell if a dinosaur broke any bones by studying its skeleton. A rough bump where a bone should be smooth is often evidence of a badly healed broken bone.

## HOT ON THE TRAIL

Fossilized footprints provide evidence about the dinosaurs which made them. They can tell us whether an animal was diseased or injured. A trackway found in North Africa was made by a dinosaur with a limp. The toes on the animal's right foot did not stick out normally. So it must have limped.

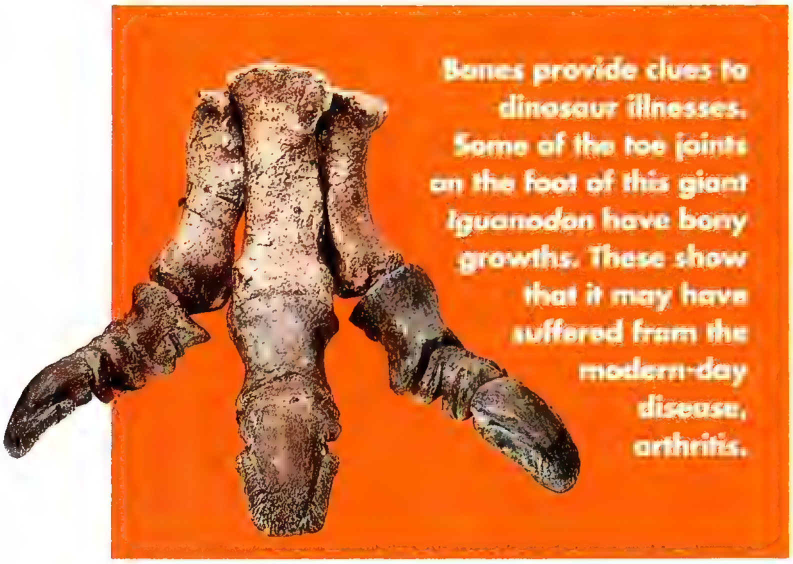


***Ornitholestes* limps along in pain. One of its toes has been lost in a deathly duel. Now it will have to hide itself away until the wound heals itself. Its enemy probably escaped unharmed.**

## IT'S A FACT

### LONG LIFE

Injury or disease probably killed most dinosaurs before they could grow old. If they stayed healthy, large dinosaurs could live for over 100 years – almost the same time as today's longest-lived animals.



Bones provide clues to dinosaur illnesses. Some of the toe joints on the foot of this giant *Iguanodon* have bony growths. These show that it may have suffered from the modern-day disease, arthritis.

### SICK DINOSAURS

Like all animals, dinosaurs must have been ill sometimes. Diseases like colds or flu are caused by tiny bacteria, or viruses. Bacteria do not make good fossils, so it is difficult to tell what diseases dinosaurs might have died from.

### BONE DISEASE

Certain diseases affect bones. Scientists have discovered marks of such diseases on fossils. They are the same diseases that affect birds and reptiles today.

This lioness has a vet to look after it. Dinosaurs were not so lucky.

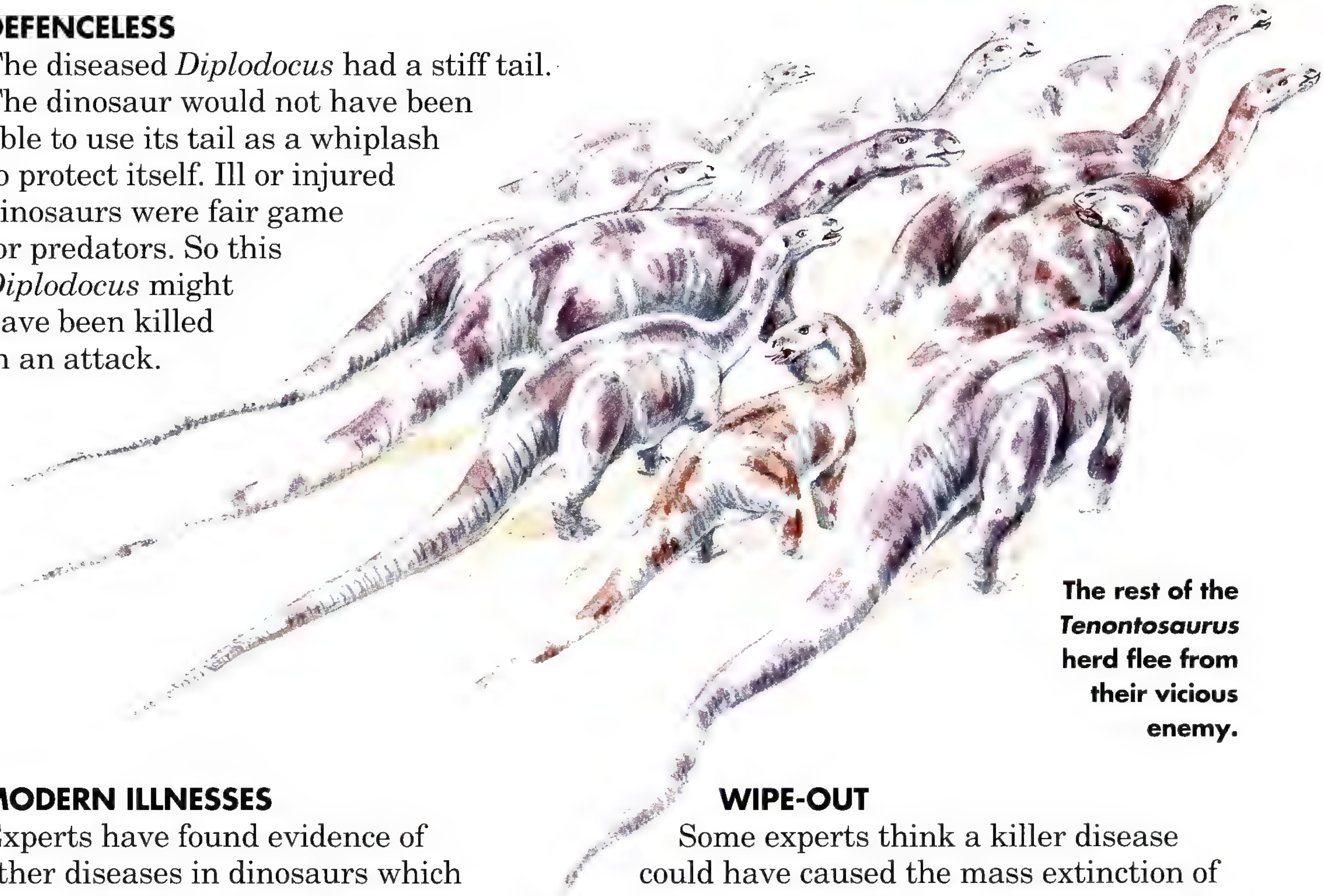
### STRANGE TAILS

Fossil bones of some sauropods show they were attacked by disease. The tail bone of one *Diplodocus* showed that its joints had joined together. Experts think this might have been caused by a disease. A healthy *Diplodocus* tail has separate joints so that it can move more freely.

**A hungry pack of *Deinonychus* attack a sick *Tenontosaurus*.**

## DEFENCELESS

The diseased *Diplodocus* had a stiff tail. The dinosaur would not have been able to use its tail as a whiplash to protect itself. Ill or injured dinosaurs were fair game for predators. So this *Diplodocus* might have been killed in an attack.



**The rest of the *Tenontosaurus* herd flee from their vicious enemy.**

## MODERN ILLNESSES

Experts have found evidence of other diseases in dinosaurs which are still common today. They discovered strange hard frills on the toe joints of an *Iguanodon* foot. These were probably made by the bone disease arthritis.

## CANCER CLUES

Scientists believe dinosaurs could have suffered from cancer, too. But the odd-shaped bones they based their evidence on could also have been caused by another disease which attacks many of today's domestic birds.

## MUSSAURUS MYSTERY

Sometimes there are no tell-tale signs to explain why or how a dinosaur died. A nest of perfectly-formed baby *Mussaurus* was found in Argentina. They had all died together. But why? Perhaps they died from a mystery virus which left no trace.

## WIPE-OUT

Some experts think a killer disease could have caused the mass extinction of dinosaurs. It might have swept across the land like one of the great plagues of history, such as the Black Death.

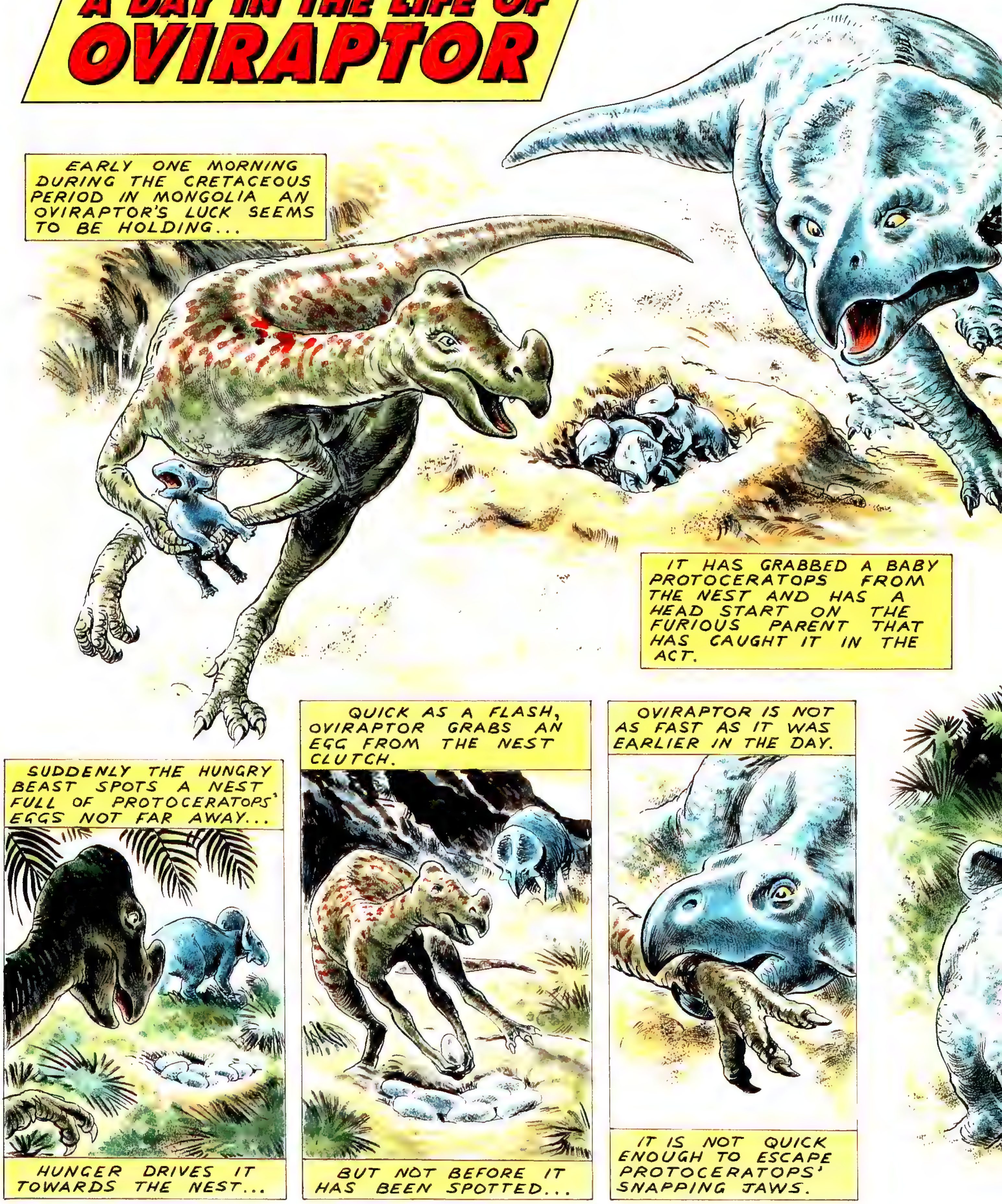
## DOMESDAY PUZZLE

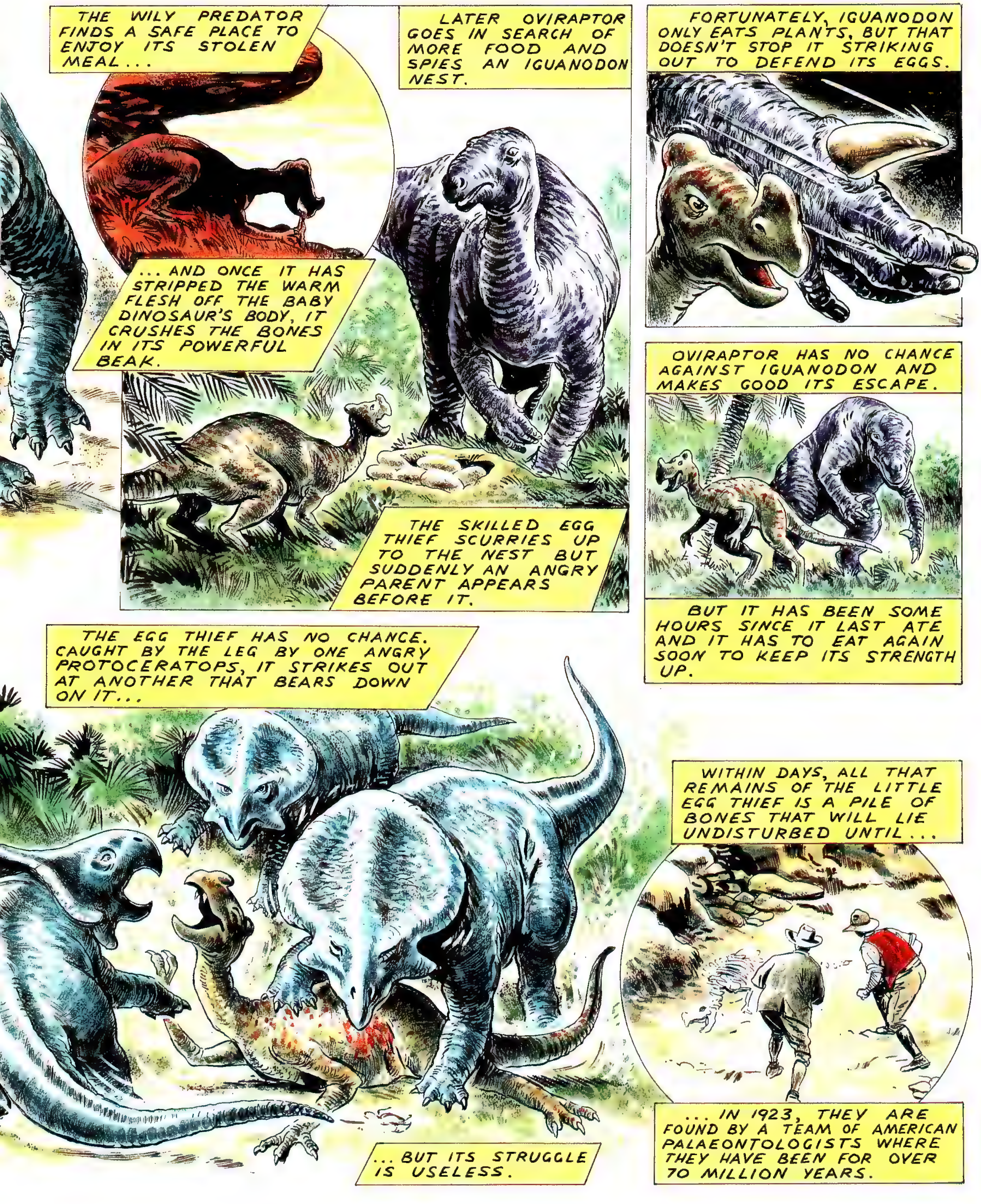
Other scientists think this is unlikely. They say it would have been impossible for one disease to have killed all the dinosaurs.

## Is it true that some dinosaurs could have been killed by eating the wrong food?

Yes, it is possible that plant-eating dinosaurs might have been poisoned by eating the wrong sorts of vegetation. Yew trees grew in the Age of the Dinosaurs. And their leaves, bark and berries can be fatal if eaten.

# A DAY IN THE LIFE OF OVIRAPTOR


EARLY ONE MORNING DURING THE CRETACEOUS PERIOD IN MONGOLIA AN OVIRAPTOR'S LUCK SEEMS TO BE HOLDING...
IT HAS GRABBED A BABY PROTOCERATOPS FROM THE NEST AND HAS A HEAD START ON THE FURIOUS PARENT THAT HAS CAUGHT IT IN THE ACT.
SUDDENLY THE HUNGRY BEAST SPOTS A NEST FULL OF PROTOCERATOPS' EGGS NOT FAR AWAY...
HUNGER DRIVES IT TOWARDS THE NEST...
QUICK AS A FLASH, OVIRAPTOR GRABS AN EGG FROM THE NEST CLUTCH.
BUT NOT BEFORE IT HAS BEEN SPOTTED...
OVIRAPTOR IS NOT AS FAST AS IT WAS EARLIER IN THE DAY.
IT IS NOT QUICK ENOUGH TO ESCAPE PROTOCERATOPS' SNAPPING JAWS.


THE WILY PREDATOR FINDS A SAFE PLACE TO ENJOY ITS STOLEN MEAL...
... AND ONCE IT HAS STRIPPED THE WARM FLESH OFF THE BABY DINOSAUR'S BODY, IT CRUSHES THE BONES IN ITS POWERFUL BEAK.
LATER OVIRAPTOR GOES IN SEARCH OF MORE FOOD AND SPIES AN IGUANODON NEST.
THE SKILLED EGG THIEF SCURRIES UP TO THE NEST BUT SUDDENLY AN ANGRY PARENT APPEARS BEFORE IT.
FORTUNATELY, IGUANODON ONLY EATS PLANTS, BUT THAT DOESN'T STOP IT STRIKING OUT TO DEFEND ITS EGGS.
OVIRAPTOR HAS NO CHANCE AGAINST IGUANODON AND MAKES GOOD ITS ESCAPE.
BUT IT HAS BEEN SOME HOURS SINCE IT LAST ATE AND IT HAS TO EAT AGAIN SOON TO KEEP ITS STRENGTH UP.
THE EGG THIEF HAS NO CHANCE. CAUGHT BY THE LEG BY ONE ANGRY PROTOCERATOPS, IT STRIKES OUT AT ANOTHER THAT BEARS DOWN ON IT...
... BUT ITS STRUGGLE IS USELESS.
WITHIN DAYS, ALL THAT REMAINS OF THE LITTLE EGG THIEF IS A PILE OF BONES THAT WILL LIE UNDISTURBED UNTIL...
... IN 1923, THEY ARE FOUND BY A TEAM OF AMERICAN PALAEONTOLOGISTS WHERE THEY HAVE BEEN FOR OVER 70 MILLION YEARS.

Improve and test your knowledge with...

# DINO Fact File

Fascinating dinosaur facts to read and 10 fun questions to answer.

## Follow the footprints

When palaeontologist Vince Sanducci from Arizona Park, USA, found a set of fossil footprints, he was not certain which animal had made them. Venturing further down the river, he found the clue he was looking for. Hidden in the rock were the fossils of the track-maker – an ancient crocodile.

**1** Dinosaurs may have used tongues to:
a) poke out at enemies
b) help them speak
c) smell other animals

**2** When a dinosaur was wounded it:
a) cried out for help
b) hid itself away
c) went to a doctor

**3** *Carcharodontosaurus* balanced itself with:
a) a large horn
b) its tail
c) very long arms

**4** *Hadrosaurus* was easily spotted because it had:
a) a clubbed tail
b) a large horn
c) a bump above its nostrils

**5** Which was the least likely cause of death for a dinosaur?
a) injury
b) disease
c) old age

**6** *Quetzalcoatlus* was a:
a) pterosaur
b) sauropod
c) theropod

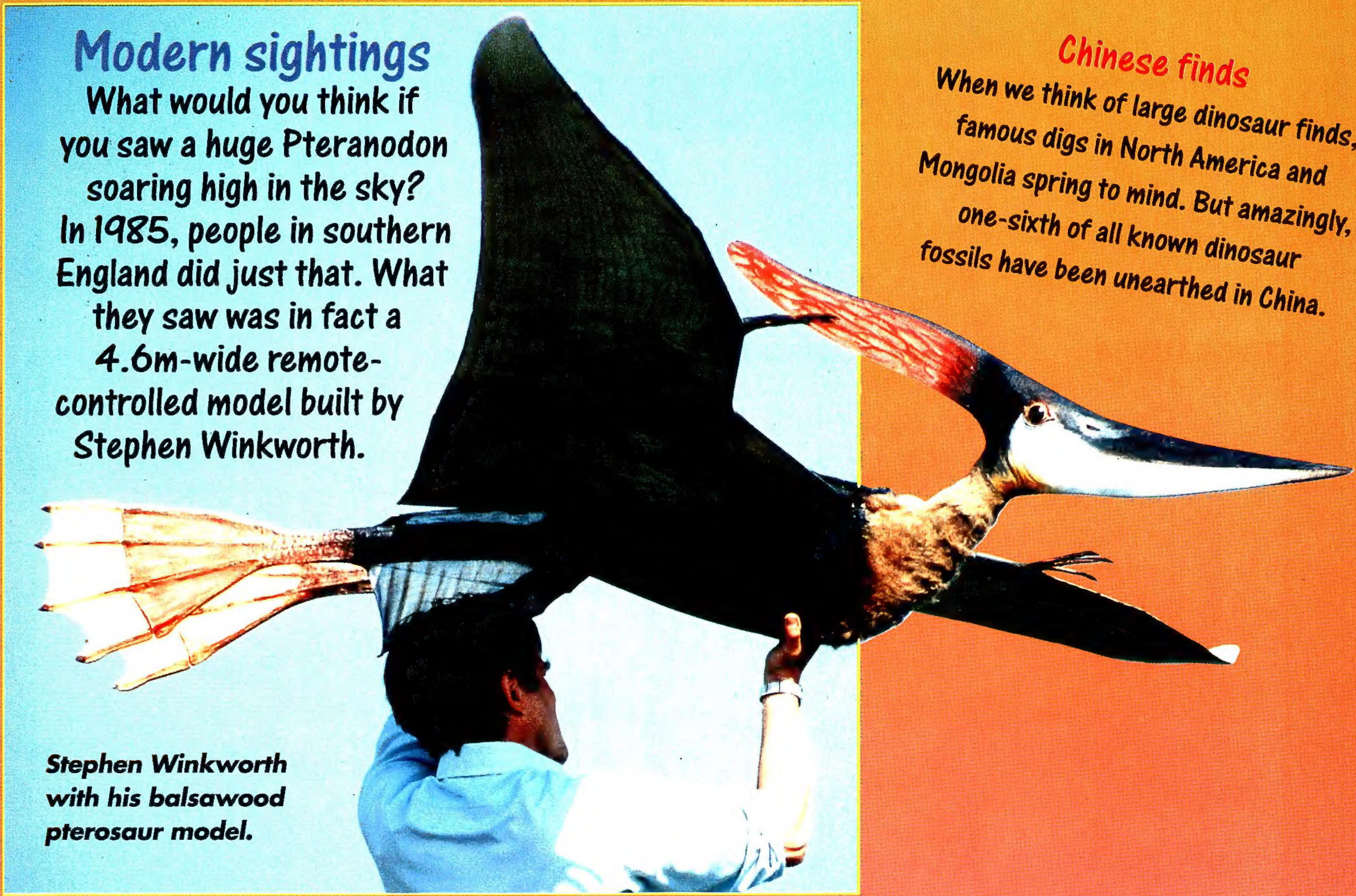
**7** *Oviraptor* liked to steal:
a) dinosaur eggs
b) animal bones
c) stomach stones

**8** *Magyarosaurus'* favourite food was:
a) other dinosaurs
b) plants
c) fish and other sea creatures

**9** *Hadrosaurus* was the first known:
a) horned dinosaur
b) duckbilled dinosaur
c) meat-eating dinosaur

## Modern sightings

What would you think if you saw a huge Pteranodon soaring high in the sky? In 1985, people in southern England did just that. What they saw was in fact a 4.6m-wide remote-controlled model built by Stephen Winkworth.



***Stephen Winkworth with his balsawood pterosaur model.***

## Chinese finds

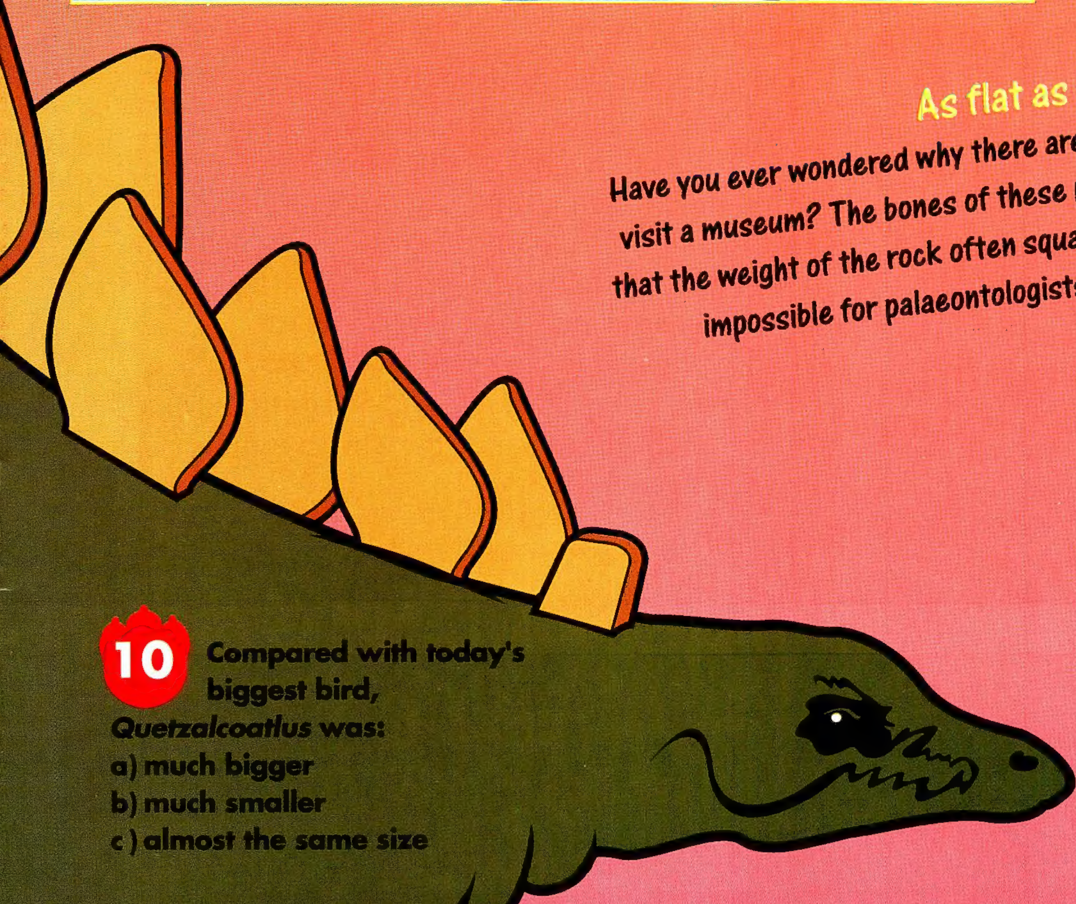
When we think of large dinosaur finds, famous digs in North America and Mongolia spring to mind. But amazingly, one-sixth of all known dinosaur fossils have been unearthed in China.

## As flat as a pancake

Have you ever wondered why there are so few pterosaur skeletons when you visit a museum? The bones of these prehistoric flying reptiles were so light that the weight of the rock often squashed them completely, making it almost impossible for palaeontologists to extract the bones for display.

## Hearty appetite

A big meat-eating dinosaur like T rex probably ate one quarter of its body weight in one huge meal. But each meal lasted it for several days. Once it had eaten, the dinosaurs it preyed on were safe – for a short time at least.



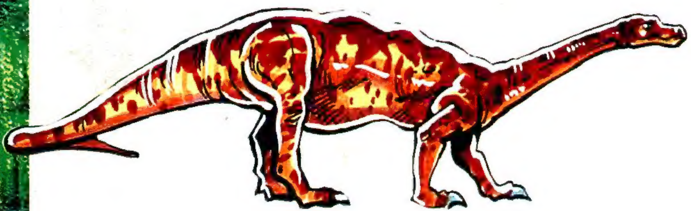
**10** **Compared with today's biggest bird, *Quetzalcoatlus* was:**

- **a) much bigger**
- **b) much smaller**
- **c) almost the same size**

**Answers to the questions on inside back cover**

**SELLOSAURUS** **200 MYA**

Long-necked *Sellosaurus* (sell-oh-saw-rus) lived in the Late Triassic Period in Germany. It walked on two or four legs and browsed among plants with its small head. *Sellosaurus* grasped branches with its long, five-fingered hands and raked the leaves off with its curved thumb claw. Its name means 'saddle reptile'.



**SHAMOSAURUS** **100 MYA**

*Shamosaurus* (sham-oh-saw-rus) was named 'Gobi reptile' in 1983 after the Gobi Desert in Mongolia where it was found. It lived in the Early Cretaceous Period, and was one of the first ankylosaurids. Its armour included bony plates, horns on its skull, and a tail club. Plant-eating *Shamosaurus* had a heavy, bulky body and walked on four legs.

**SHANSHANOSAURUS** **75 MYA**

An agile hunter, *Shanshanosaurus* (shan-shan-oh-saw-rus) was lightly built and had short arms. It moved speedily on two legs. *Shanshanosaurus* had large, curved teeth for tearing apart the flesh of its prey. These were set in quite slender jaws. It was as long as a large dog and had a big head shaped rather like *Deinonychus' head. Shanshanosaurus* was named after Shanshan County in Xinjiang, China, where it was discovered.

**SHANTUNGOSAURUS** **75 MYA**

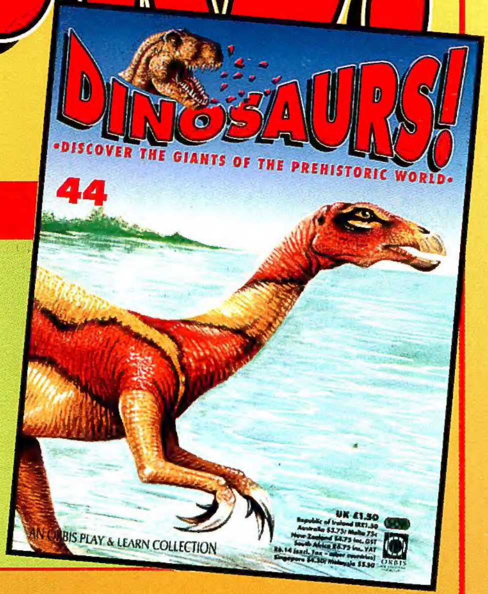
One of the biggest of the duckbilled dinosaurs, *Shantungosaurus* (shan-tung-oh-saw-rus) was as long as three cars. It lived in Shandong, China, and its name means 'Shantung reptile'. *Shantungosaurus* stood on two or four legs and scooped mouthfuls of vegetation into its broad, toothless beak.

**SHUNOSAURUS** **160 MYA**

More than ten skeletons of the sauropod *Shunosaurus* (shoo-no-saw-rus) have been found. It lived in the Mid Jurassic Period in Sichuan Province, China, and takes its name from an old Chinese word for Sichuan. Plant-eating *Shunosaurus* was almost as long as a double-decker bus. Its bulky body was balanced by a long neck and a tapering tail. Four huge, pillar-like legs supported its heavy weight. It cropped plants with strong, spoon-shaped teeth.

**MYA = MILLION YEARS AGO**

## COMING IN PART 44 OF

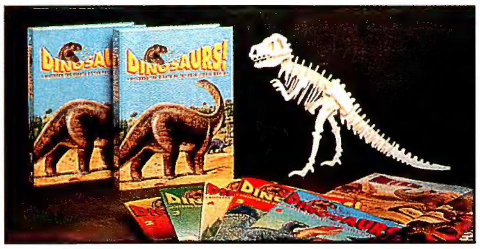

DINOSAURS!
•DISCOVER THE GIANTS OF THE PREHISTORIC WORLD•
44
AN ORBIS PLAY & LEARN COLLECTION
UK £1.50
ORBIS

**How did a dinosaur the height of a three-storey house support its giant body? Did dinosaurs have brains in their tails? The answers are in TIME DETECTIVE and SPOTTER'S GUIDE.**

### PLUS

**Meet three more exciting dinosaurs in IDENTIKIT and**
**DINOSAUR WORLD**
**3-D GALLERY**
**HISTORY IN PICTURES**
**GIANTS OF THE PAST**

## DINOSAURS! binders



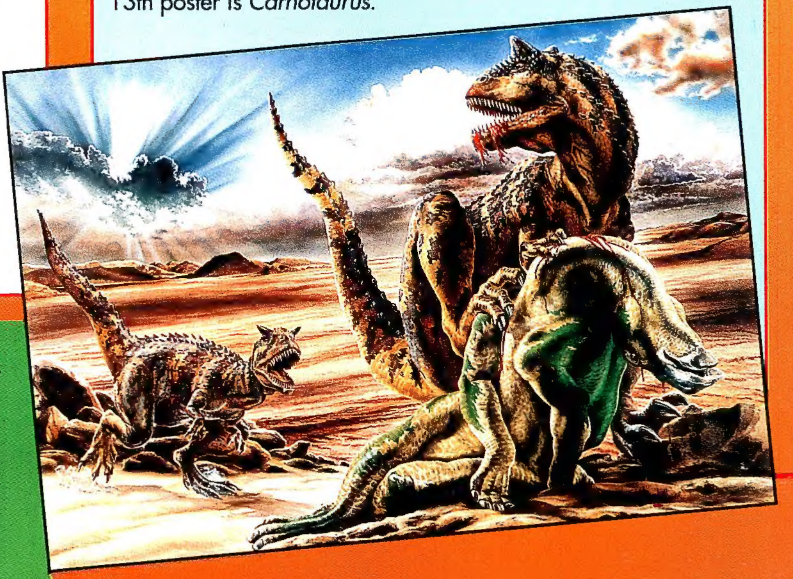
### Keep your copies safe and neat with these fantastic binders.

Your binders have been designed to look good at home or at school. Each is sturdy and hardwearing – it even has a wipe-clean cover – and holds 13 issues. You'll want to use your DINOSAURS! collection again and again – for reference, for school projects, or just for fun. So don't let your copies go missing; keep them in your own set of binders.

**DINOSAURS! binders are now available and cost just £4.95 (including £1 p&p). Please refer to the information on the inside front cover or telephone 0424 755755 for details.**

## THE DINOSAURS! POSTER COLLECTION

Have you ever wanted to fill your room with dinosaurs? Now you have your chance – with the *Dinosaurs!* POSTER COLLECTION. Each poster is 820 x 570mm (nearly eight times the size of this page) and features a superb dinosaur artwork. You'll find facts and figures about the dinosaur on the back – PLUS a look at some other prehistoric animals. The 13th poster is *Carnotaurus*.



**ANSWERS TO DINO FACT FILE QUESTIONS:** 1.c 2.b 3.b 4.c 5.c 6.a 7.a 8.b 9.b 10.a

**PICTURE CREDITS:** Front cover: Tim Hayward. Martyn Cowley 1017 B; Robert Harding 1014 TR; Natural History Museum, London IFC, 1024 TL, 1026 TL; NHPA 1017 TL, TR, 1022 B, 1023 TL; Oxford Scientific Films 1015 BL, 1016 TR, 1023 BR; Planet Earth 1026 TR; Science Photo Library 1031; Texas Memorial Museum, The University of Texas at Austin 1015 BR.

**Artwork:** Black Hat 1032; Robin Bouttell/Wildlife Art Agency 1026 B, 1027 T; Robin Carter/WLAA 1010 T, 1024 B, 1025 T, 1026 B, 1027 T; Mike Dorey 1028/9; Tim Hayward 1018/9; Deidre McHale: back cover; Steve Roberts 1012 B, 1013 B, 1022 BL,T, 1023 TR,BL; James Robins 1012 B, 1013 B; Graham Rosewarne 1009, 1010/1; Peter David Scott/WLAA 1014/5, 1016 B; Steve White 1020/1.

Dr. David Norman of Cambridge University answers your dinosaur questions

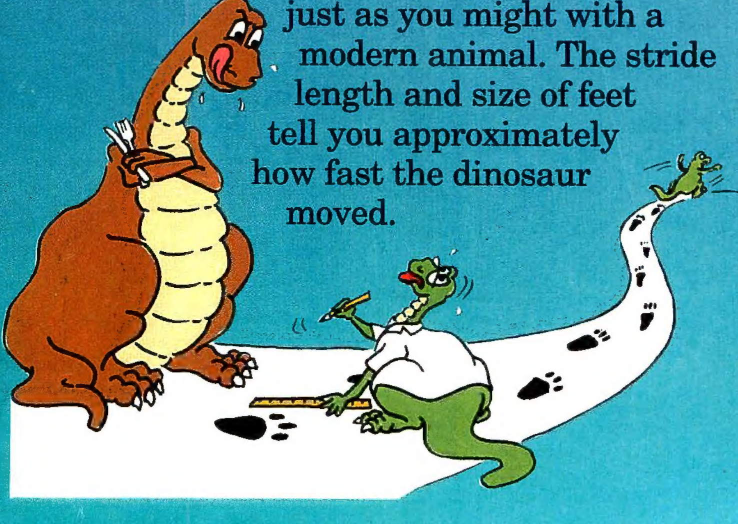
# ASK THE EXPERT

## Did dinosaurs fight their own kind?

Male ceratopians such as *Pentaceratops* may have waved their big frills to scare off rivals for mates. If this did not work, then they may have fought by locking horns and having pushing and shoving contests to see who was the strongest. It was rare for such dinosaurs to actually injure one another, but accidental stabbings must have occurred.

## How do scientists know how fast a dinosaur could run?

There are two ways of estimating dinosaur speeds. Firstly, you can compare a dinosaur's leg bone with the leg bones of animals known today. The more similar the shape, the more likely it is that the dinosaur ran at a similar speed to the modern animal you are comparing it with. Secondly, you can use the footprints left behind by running dinosaurs, just as you might with a modern animal. The stride length and size of feet tell you approximately how fast the dinosaur moved.

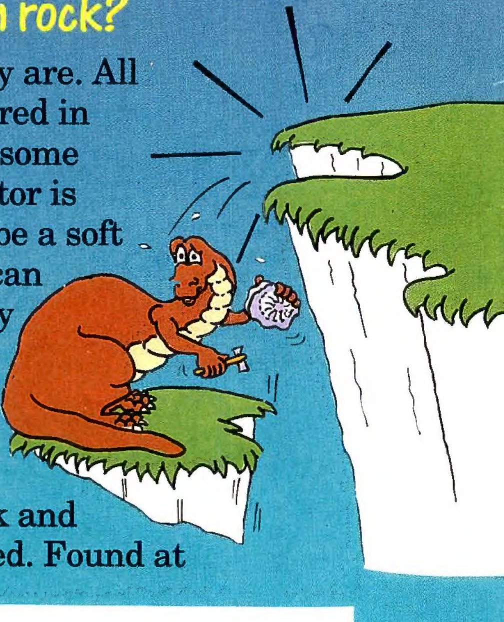


## Did any dinosaurs eat fruit?

We don't know. However, some dinosaurs, like the ornithomimosaurs or 'ostrich dinosaurs', had no teeth but a horny beak similar to a modern bird's. Their striking resemblance to modern flightless birds, such as ostriches and emus, suggests that their feeding habits were similar too. So, they may have had very varied diets which included lizards, small mammals, insects and possibly fruit and berries.

## When fossils are discovered are they always set in rock?

Most of the time they are. All fossils start out covered in sedimentary rock of some sort. If a fossil collector is lucky, the rock may be a soft clay or shale which can be easily prised away from the fossil bones. Sometimes, natural weathering can do this job for you, eroding the rock and leaving bones exposed. Found at the right time, they are easy to collect. But left for too long, exposed fossils can be destroyed.



43
9 771351 122017